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SPECIAL FEATURES

A NEW GUST SOARING MONOPLANE

AIR POWER AND NAVAL CONSERVATISM

REGULATIONS OF THE DAYTON AIR RACES

NAVY ADOPTS NEW BOEING TRAINING PLANE

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The Round the World Flight

No venture since the trans-Atlantic Flight has had such hearty approval of everyone informed about aviation as the proposed Round the World Flight of the Army Air Service. Here is a carefully conceived project that is based on sound engineering experience, aeronautical investigation and matured planning. It will, if successful, give to the world a wealth of information that pioneering of this kind always uncovers. The preliminary survey alone has brought out many facts that only such a trip would disclose.

This venture will strongly appeal to the imagination of the world. It will recall Magellan's first circum-navigation of the Globe in 1519, the Jules Verne fiction and numerous round the world races against time. It will also afford a demonstration of the possibilities of aircraft for intercontinental voyages.

The Army Air Service has selected pilots whose daring and skill cannot be surpassed in any service. Their progress will be followed by the peoples of all countries and in their successful advance westward they will be stimulated by the thought that they are real couriers of good will from this country to the other parts of the world.

The Alaskan and Asiatic sections of the trip as well as the Greenland stretches will be the chief obstacles to success. But even here, with the luck that seems to guide our pilots on the most hazardous undertakings, these sections of the globe encircling flight ought not prove excessively dangerous or insurmountable.

Probably the most startling results that will come from the trip will be the time taken to encircle the earth when compared with other means of travel. The time it will take to fly from Seattle to Japan will indicate the possibilities of trans-Pacific air travel. The time of the trip from Scotland to Maine will similarly show the possible schedules of trans-Atlantic air transport.

To the personnel of the Army World Flight AVIATION extends every good wish for success and entire completion of this noteworthy adventure.

Floating Airship Bases

SOME interesting possibilities are suggested by the development, originally for the Navy's Arctic air expedition, of airship tenders equipped with mooring masts. Their value in naval operations was pointed out by Rear Admiral Hilary P. Jones, former commander in chief of the Atlantic Fleet and present member of the General Board of the Navy, when he said: "It is well to bear in mind that if airships are to operate with the Fleet, there will be many occasions on which mobile bases with mooring facilities will be vitally necessary. Therefore, the question of fitting masts on ships is not wholly bound up with the expedition under discussion."

It requires no stretch of the imagination to picture the value of these vessels to airship operations with the Fleet. It would be manifestly impossible to place mooring masts on land at every point in the vicinity of which an airship might be required to operate in the event of war. To do so would mean that the earth must be bristling with mooring masts for the chance convenience of possible belligerents. But one or two ships fitted with masts and able to steam under the protection of the Fleet to any desired point would provide floating airship bases that leave little to be desired.

The idea of mooring airships to surface vessels incidentally opens up interesting vistas regarding the capital ships of the future. Whether, as has been suggested, the equipping of present type battleships with mooring attachments would be a practical solution for any but very small airships, remains to be seen. But it is possible to visualize the aircraft carrier of the future as a combined airship and plane tender which would carry such an aggregation of punishing power as to become a capital ship in the full meaning of the word.

The Light Plane Races at Dayton

ONE of the most gratifying features of the International Air Races to be held in Dayton next fall is the inclusion in the program of two events devoted to low powered airplanes. Previous to the official issuance of the program, misgivings were entertained in numerous quarters that yet another year would pass without anything constructive being done to foster the development of American light planes and the requisite power plants. As these misgivings were editorially voiced by AVIATION, we take particular pleasure in pointing out to all light plane enthusiasts that they will be able to compete in two of the twelve events scheduled to take place at Dayton air races.

The type of contest selected for the two events is to be commended in principle. Both light plane events will be run over a 5 mile course so that the contestants should be in full view of the spectators all the time. This feature will greatly add to the spectators' enjoyment. As the first light plane event will be a race over five laps (25 miles) only, the fledglings will have a fair chance to show their mettle. This race will more or less constitute an elimination contest for the second light plane contest, for speed and efficiency, which will be run over a distance of 50 miles. The rating of the contestants in this event by a figure of merit is an excellent idea, and the right step to obtain a good performance with fuel economy.

Now it only remains to be hoped that American light plane enthusiasts will settle down to work and utilize the remaining six months to the best of their ability in producing low powered airplanes of good all-round performance.

Air Service Asks for New Observation Planes

Aircraft Manufacturers Invited to Design Plane Around Curtiss, Wright, Liberty, or Packard Engines

The Air Service is vitally interested in the problem of developing a two-seater corps observation airplane which will be a distinct advance over present types, and with this end in view contemplates the purchase in the fall of 1924 of four experimental corps observation airplanes.

Original Designs Wanted

The Chief of Air Service feels that the interests of the Government, and of the aircraft industry as a whole, can best be served by inviting qualified manufacturers to submit complete airplanes of their own design and constructed in accordance with the specification and other requirements of the Air Service for this type for consideration and test. The Chief of Air Service believes, after consultation with the majority of airplane manufacturers, that a large possible economic loss to the aircraft industry will be avoided by limiting the number of sample airplanes to be submitted in accordance with the terms of this Circular to include only those most interesting to the Air Service.

All such designs submitted which are not approved will be returned to the manufacturers submitting them on or before April 20, 1924.

Designs may be made around any one of the following engines: Wright T3, Curtiss D12, Liberty or Packard 1A1500.

The Chief of Air Service will rate the designs submitted, as far as practicable, in accordance with a rating scale and will select therefrom at least four which appear most desirable. On or before April 15, 1924, the contracting officer will notify those manufacturers who submit designs whether or not samples constructed in accordance with the design submitted will be received by the Air Service for test in accordance with the terms of this circular, and will at that time allot the available engines.

Awards and Prizes

It is proposed to set aside sufficient funds for the purchase of four of the sample corps observation airplanes submitted in accordance with the terms of this circular and which meet the requirements of the specification, at the following prices:

For the best airplane submitted	$70,000.00
For the second best airplane submitted	$60,000.00
For the third best airplane submitted	$50,000.00
For the fourth best airplane submitted	$40,000.00

The Government reserves the right to reject any sample airplane which does not meet the performance required by the specification, and which does not comply approximately with the remaining requirements of the specification. Should the sample airplane exceed the specification in one respect and fail to meet it in another, its rating will be adjusted by the Chief of Air Service.

Each sample airplane shall be delivered either f.o.b. cars, Dayton, Ohio, or flown to McCook Field on or before Nov. 5, 1924. Ordinary expenses of setting up the airplane submitted will be borne by the Government. The Government, however, will not undertake to set up any airplane which has not been completely set up and all installations made in proper working order before being shipped.

Demonstration Flights

The bidder shall make a demonstration flight, with his own pilot, at his own risk, but at the expense (except pilot charges) of the Government. This demonstration flight shall consist of high speed at ground and tests of maneuverability.

The Government will then make complete flight tests with Government pilots of all airplanes submitted which are, in its opinion, airworthy after the completion of the demonstration flight, for the purpose of determining the order of merit.

All flight tests shall be made with only one design of propeller, that is, the bidder may not use a high speed propeller for the speed courses and a climbing propeller for climb and ceiling.

At no time during the official performance tests of the sample airplanes submitted, shall the r.p.m. or output exceed the maximum r.p.m. or output at which the engine has successfully passed a 50 hr. test under the supervision of either the Engineering Division, Air Service, or the Bureau of Aeronautics, Navy Department.

The Government will supply the bidder f.o.b. cars, Dayton, Ohio, all armament and equipment specified as being furnished by the Government, provided that the bidder furnish a surety bond satisfactory to the contracting officer, in the amount of the full value of such equipment, conditioned upon the return thereof in the same condition as delivered by the Government.

The only engines, however, which can be supplied by the Government are the standard Curtiss D12, Liberty, Wright T3 and the Packard 1A1500. The Air Service has no Wright T3 or Packard 1A1500 engines on hand at the present time, however, it is expected that two Wright T3 engines will be available on or about May 1, 1924, and two Packard 1A1500 engines on or about July 1, 1924. The Government reserves the right, in case there are more than two applications for these engines, to select the manufacturers to whom these engines shall be issued.

Specification for Two Seater Corps Observation Airplane, Type X

This specification covers the general requirements of the Air Service for a two seater corps observation type of airplane, with a water-cooled engine.

Following is a approximate summary of the total load which the airplane shall be designed to carry:

		Approx. weight lb.
(a)	Crew—two	380
(b)	Fuel—½ hr. at ground and 2½ hr. at 15,000 ft. or ½ hr. at ground and 450 mi. cruising range	
(c)	Oil—10% of fuel by volume	
(d)	Armament	240
(e)	Equipment	
	Instruments	19
	Electrical	217
	Miscellaneous	119

The following performances with full load are required with the normal r.p.m. of the engines:

(a) High speed at ground 150 mi./hr.
(b) Time to climb to 15,000 ft., 20 min.
(c) Service ceiling, 21,000 ft.
(d) Landing speed not over 60 mi./hr.

The above performances shall be made without a supercharger.

Landing gears without an axle connecting the wheels on opposite sides of the airplane shall be provided. Retractable landing gears are not desired.

Pilots' seats shall be adjustable on the ground in a horizontal and vertical direction. The amount of adjustments shall be at least 4 in. horizontally and vertically.

Provision for landing lights on the wings shall be made.

All seats and cockpits shall be arranged with due consideration to the comfort and convenience of the crew.

Dimensions of fuselage—The rear cockpit shall be 32 in. wide (outside dimension). The distance from the floor to the top of the scarf mount shall be 42 in.

There shall be at least 15 in. clearance between the fuselage and the upper wing, which shall obscure not more than 30 deg. in a vertical plane of the pilots' cone of vision. The lower wing shall neither obstruct the pilots' vision in the region swept by a plane rotated 30 deg. from the horizontal, nor obstruct more than 45 deg. in a vertical plane of the cone of the pilots' vision, nor obstruct the observers' vision in a plane swept 30 deg. forward from the vertical.

Angle of fire for the gunner shall be such that lines of fire from the rear guns will intersect at a point not greater than 150 ft. below the fuselage. The gunner should be able to fire at least 30 deg. forward of a vertical line projecting downward, and as much farther forward as possible.

It is of primary importance that the design shall be such as will insure ease of production, easy and rapid installation of power plant and equipment and ease of general maintenance. The airworthiness, handiness of control and general flying qualities of the airplane must be satisfactory to the Air Service. Either metal, wood, or mixed propellers may be used. Dual control shall be provided.

Power Plant

The power plant to be installed will be left to the judgment of the contractor.

Crash proof gasoline tanks conforming to Specification No. 28,302 shall be furnished and installed by the manufacturer unless the tanks are installed in the wings, in which case the manufacturer may use any type of tank he desires. Fuel tanks droppable in the air by an instantaneous releasing mechanism are desired. Engine starters shall be provided.

The airplane shall be capable of receiving a side type supercharger installation without extensive modification. Extra fuel and oil tanks with sufficient capacity for an additional 150 mi. cruising range shall be provided.

Armament

The armament shall be installed by the contractor, and will be furnished by the Government for installation, free of charge.

The armament will consist of one fixed 30 cal. aircraft gun with Nelson gun control, the installation providing for interchangeable use of Marlin and Browning 30 cal. machine guns; and of two flexible Lewis guns, with the necessary ammunition.

Instruments and Accessories

The location of the instruments shall be such that they will function properly under all service conditions, to which this type of airplane is subjected. Each item of equipment shall be marked to show its use, shall be accessible and readily installed and removed.

Following is a list of the instruments which shall be installed on this airplane by the contractor. The instruments will be furnished by the Government, free of charge: Airspeed Indicator, Venturi Pitot Head, 25,000 ft. Altimeter, Airplane Compass, Aircraft Clock, Gasoline Pressure Gage, Oil Pressure Gage, Tachometer, Inclinometer, Small Negative Lens, Universal Gasoline Level Gage, Water Thermometer and Bank and Turn Indicator.

In case an electric starter is used, Bijur Starter will be installed.

The following miscellaneous equipment shall be installed by the contractor: Type K3 Camera, Rolls Film, Venturi, Parachutes, Gunner's Belt, Pilot's Belt, Life Preserver Cushions, Fire Extinguisher and Bracket, Propeller Cover, Cockpit Cover, Engine Cover.

Provision shall be made in the seating arrangement so that a seat type parachute may be worn by the pilot. The lap type will be worn by the observer.

Small stamped aluminum plates shall be placed near all instruments or controls. These plates will name the instrument or control and, if necessary, give its function and methods of operation.

Rating Table for Observation Planes

In order to assist manufacturers who desire to submit Corps Observation Airplanes, on or before Aug. 1, 1924, under terms of the foregoing Circular, the following system of ratings have been worked out.

This system assigns a certain number of points to the various characteristics of the airplane and is designed, primarily, to give manufacturers an idea of the relative importance which the Air Service attaches to the different characteristics of these airplanes. Realizing quite fully that the design of a really successful airplane is a compromise between various conflicting requirements, the Air Service hopes that the following list will serve to guide the manufacturers in knowing just how far to attempt to obtain the very best in any one particular characteristic at the expense of the others. It should be noted that to avoid fractional points, the total number of points is 145. A detailed explanation of each item appearing in this list is given after the list itself. In general, it shall be the policy to give the maximum number of points to the airplane showing the best qualities, where such qualities cannot be accurately measured, and to rate competing airplanes accordingly.

Performance			35
150 mi./hr	High Speed at Ground	10	
	1 pt. for each mile per hour		
21,000 ft.	Service Ceiling	15	
	1 pt. for each 200 ft.		
20 min.	Time of Climb to 15,000 ft.	5	
	1 pt. for each minute.		
450 mi.	Cruising Range	5	
	1 pt. for each 25 mi. over		
	1 pt. for each 10 mi. under		
Flying Qualities			35
	Stability	10	
	Maneuverability and controllability	10	
	Landing and taxiing	10	
	Take off	5	
Maintenance			20
	Power plant	10	
	Airplane	10	
Ease of reproduction			10
Miscellaneous			25
	Vision	5	
	Equipment installation	6	
	Armament installation	5	
	Stabilizer adjustment	2	
	Control mechanism	2	
	Cockpit arrangement	2	
	Safety of crew	10	
	Vulnerability of cooling system	10	
	Engine starter	3	
	Provision for supercharger	2	
	Extra fuel and oil capacity	4	
	TOTAL		145

Performance

Under performance there is to be considered:

(a) High Speed at Ground. This, as required in the specification is 150 mi./hr., which means that any competitor obtaining 150 mi./hr. will be given a total of 10 points with a reduction of one point for each mile per hour which his airplane falls below this amount, and a corresponding increase of one point for each mile per hour that the airplane goes above the specified high speed. Any airplane with less than 145 mi./hr. high speed at ground will have small chance of being accepted.

(b) Service Ceiling. This is specified as 21,000 ft., which if attained, will give the competitor 10 points. For every 200 ft. below 21,000 ft. the competitor will be reduced one point and will be given a corresponding increase of one point for each 200 ft. above 21,000 ft. Any airplane which has a ceiling less than 19,000 ft. will have small chance of being accepted.

(c) Time of Climb to 15,000 ft. This is specified as 20 min. with a reduction of one point for each minute increase in time and a corresponding addition of one point for each minute decrease in time. Any airplane which takes 25 min. or more to climb to 15,000 ft. will have small chance of being accepted.

(d) Cruising Range. The factor is included with performance as it is so intimately connected with performance characteristics. To some extent it is synonymous with fuel and oil capacity but, after consideration of the problem, it was deemed advisable to make the requirement in miles per hour rather than in hours, and thus let the speed of the airplane enter into the consideration. The requirement is a cruising range of 450 mi. Five points are allotted for this characteristic, with a reduction of one point for each 10 mi. below this specified requirement and a corresponding increase of one point for each 25 mi. above the requirement. An airplane having a cruising range of less than 400 mi. will have a very small chance of being accepted. It is desired that extra fuel and oil tanks be provided giving an additional 150 mi. cruising range. All tests will be made with those extra tanks omitted.

Flying Qualities

An airplane, of course, might possibly have such poor flying qualities as to be entirely unsuitable. In such case, it would not be accepted whatever the rating by points. Among airplanes approximately suitable, however, there may also be various differences to which the following applies:

(a) Stability. This, in brief, is meant to convey the idea that the airplane must be a stable gun platform. An airplane which is unstable, and does not hold its course easily, would

of course be unsuitable and reduction in points would be made for such undesirable characteristics. An allowance of ten points has been made for this item. No very definite information can be given on the number of points reduction for failure to obtain the degree of stability desired. However, for the benefit of manufacturers, it might be stated that the stability characteristics of the DH4B airplane are considered excellent. Quite heavy reduction will be made for failures to attain this characteristic

(b) Maneuverability and Controllability. This item, which is believed self-explanatory, has been assigned an allotment of ten points. For the benefit of manufacturers, it might be pointed out that the handling of the Lepere airplane is considered satisfactory.

(c) Landing and Taxiing. The ability to land in small space and control of the airplane at slow speeds in the air and on the ground will come under this item. The advantage of radeless type landing gear and steerable tail skid will, of course, have a bearing here

(d) Take Off. The ability to take off, particularly in cross winds or rough fields, will be considered in this item. It might be here pointed out that the take off of the DH4B airplane is satisfactory.

Maintenance

Under this title two items are listed

(a) Power Plant. This includes, in addition to the engine proper, all accessories such as gas tanks, hose connections, starter, pumps, distributors, and correspondng accessibility of all these parts.

(b) Airplane. This will include the maintenance of the airplane proper such as fittings, fuselage, and wings, wing hinges, control fittings, and corresponding accessibility of all the above parts

Miscellaneous

Under this title are listed all those smaller items which could not be properly included in any of the divisions given above

(a) Vision. The desired amount of vision has been explained in the specification. Failure to approximate this may cause rejection. The five points cover slight deviation from the specification, and choice of arrangements meeting the specification.

(b) Equipment Installation. This item is self-explanatory and has been allotted five points to cover variations in the method of installation of the specified equipment

(c) Armament Installation. This item is also self-explanatory and has been covered quite fully in the "Handbook for Airplane Designers," June, 1922. An allotment of five points has been made on this item, to cover variations in the specified method of installation of the specified armament or departure from the Handbook resulting in unsuitable installation.

(d) Stabilizer Adjustment. This includes all mechanisms for adjusting the horizontal stabilizer, and ease of adjustment, convenience to the pilot, and action under load and under eccentric loads will be given consideration

(e) Control Mechanisms. This includes mechanisms for operation of the control surfaces. The rigidity and the ability to withstand the ordinary wear and tear of the service airplane will be given consideration

(f) Cockpit Arrangement. This item includes all arrangements in the cockpit for the comfort and convenience of the crew. The location of throttles, of controls, and all other items are here considered. The protection of the crew from unpleasant wind is also included

(g) Safety of Crew. This item is somewhat connected with cockpit arrangements but not entirely. It includes all provisions made for safety of crew and may include such items as gas in the wings, droppable tanks, protection of the face in case of a crash, or protection against a nose-over, ease of egress with parachute, etc

(h) Vulnerability of Cooling System. Knowing that there will be some tendency to use wing skin radiators, whose use may increase the performance at the expense of vulnerable area, it has been determined to make an allowance of ten points for this item.

(i) Engine Starter. As required in the specifications this airplane should be equipped with an engine starter. This need not necessarily be an electric starter, but may be a hand starter, or any other type which gives satisfactory service.

(j) Provision for Supercharger. The specification states that provision should be made for installation of sidetype supercharger without extensive modification. Just what this modification consists of is open to considerable discussion. It was therefore decided, in order not to too severely penalize those airplanes whose arrangement would not easily take sidetype supercharger, to allow two points for this item.

(k) Extra fuel and oil tanks. It is desired to have extra fuel and oil capacity for an additional 150 mi. cruising range. All tests will be made with the tanks either empty or removed.

The above system of ratings are designed with the idea of assisting the manufacturer in developing an airplane that would be a credit to his organization and satisfactory to the Air Service. The Board of Officers charged with the responsibility of selecting these airplanes will be guided to a large extent by the result of these ratings. It will not be considered, however, as binding them to purchase the airplane which gets the largest number of points nor to reject the airplane which has the smallest number of points. The whole spirit is to discourage any freak constructions which would just meet the specifications at the expense of reliability and service and to encourage the development of a corps observation airplane which will be a real credit to aircraft manufacturers of the United States.

Naval Reserve Aviation Policy

Following is an official outline of the Navy policy regarding the organization of Naval Reserve Aviation:

"In order to supply a sufficient number of trained Naval Aviators to complement the Aircraft Squadrons involved in the War Plan of the Navy Department, the herein contained Aviation Policy for the United States Reserve Force is adopted and will be placed into effect as the funds for its support become available.

"In each Naval District where the public is sufficiently interested in the project, and where conditions warrant it, there shall be organized and maintained a Naval Reserve Aviation Unit capable of turning out at least ten newly trained pilots a year. The strength of the Aviation Reserve will be kept up by this yearly influx of pilots.

"The mission of these Naval Aviation Reserve Units is the acquirement and training of new members sufficiently young, and who are suitable officer material, thus insuring a supply of new blood, and the maintenance of the efficiency of members already qualified.

"The training shall be conducted along lines that will: (1) Enable the qualified pilots to maintain proficiency in flying, and to be kept conversant with the developments and policies of Naval Aviation, (2) Give the personnel experience in the upkeep of material, (3) Give elementary flight training to newly enrolled reservists, (4) Outline and carry out work and study to be effected in the form of weekly drills between periods of active duty training.

"The organization, administration, discipline, and training of each unit shall be under the supervision of the Commandant of the district in which it is located. When, in the opinion of the Commandant, it is advisable to establish a Naval Aviation Reserve Unit he shall make recommendation to the Department in this regard, and, after approval by the Department of the establishment of the proposed unit, take the necessary steps to organize the personnel, to obtain suitable location for the aviation activities in view, and to insure that adequate facilities for the care, preservation, and safe operation of the material will be available. He shall make request on the Bureau of Aeronautics for the supply of necessary aircraft and aviation material.

"To insure uniformity in the organization of these units and standardization of the training methods employed, a standard Naval Aviation Reserve Unit shall consist of two training planes, with 50 per cent spares, and aviation material. Aircraft and aviation material to the extent that it can afford, will be supplied by the Department; but in view of the shortage of funds, the Navy Department must look to the civil authorities of the community in which the unit is to be established for cooperation and material assistance in obtaining those items which the current appropriations can not undertake.

"On account of the existing shortage of personnel in the Aeronautic Organization of the Navy, the Department will not be able to detail officers and men of the regular establishment to these units for duty. The Commandant will, however, upon authorization to form a Naval Reserve Aviation Unit in his district be further authorized to call to active duty one Lieutenant (Naval Aviator) U.S.N.R.F. Class 5, as Commanding Officer of the Unit. This officer should be qualified for administrative duty and in addition should be a competent flight instructor, operations officer, and assembly and repair officer. The Commandant will also be authorized to call to active duty four aviation mechanics of the Reserve Force to act as the maintenance and operating crew of the unit.

"Each of these standard units shall undertake the training of ten new aviation reserve pilots each year in accordance with the elementary training syllabus prescribed by the Department. The training of Aviation observers shall not be included in the mission of the unit. Where conditions are such as to warrant larger units than the standard unit, a double unit may be authorized.

"The enrollment of new members for flight training will be in the rating of Seamen, 2d Class.

"After the physical examination and the details of their enrollment, those Seamen who do not successfully complete the ground school course and the elementary flight training will be disenrolled. Those who do complete with success the ground school course and elementary flight training, and who are so recommended by the Commandant, will be ordered to a service unit of the Aeronautic Organization of the Navy for a period of at least forty-five days for observation and further training in service type planes, under actual service conditions.

"Upon the completion of the period of training in a regular service unit, if recommended by the Commanding Officer of that unit, and the Commandant of his district, the student will be commissioned as Ensign, U.S.N.R.F. Class 5, and will be given an Aviation designation as Naval Aviator (Reserve Force).

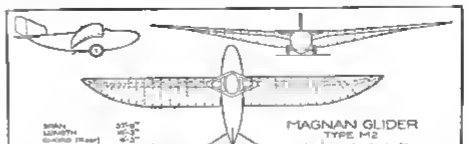
"The age limit on enrollment as Seamen, 2d Class shall be 18 to 28 years. In cases of men who enroll and qualify before the student has reached the age of 21, the commissioning of that man as Ensign shall be authorized. The upper age limit of Naval Aviators (Reserve Force) who may be retained in Class 5 shall be 35 years of age.

"Civil pilots who are engaged in flying for civil firms and who are suitable officer material may be enrolled in the Naval Aviation Reserve Force. Such aviators shall be given credit for their flying time with civil firms; and immediately upon their enrollment shall be qualified for the forty-five days' advanced training and observation with a service unit, after which if recommended by the Commanding Officer of the regular service unit, they may be commissioned as Ensigns, Naval Reserve Force, Class 5, and designated Naval Aviators (Reserve Force)."

The Magnan Monoplane Glider

A French Machine Designed for Gust-Soaring

While soaring in an up-current of air, over the slope of a hill or range of hills, presents no particular difficulty, provided the rising current is strong enough and the machine has a sufficiently good gliding angle and ample controllability, gliding in a horizontal wind, by making use of such turbulence as exists in the wind, is at present outside the practical pos-



Outline drawings of the Magnan glider, specially built for gust-soaring

sibility, although theory indicates that a certain amount of energy should be available for soaring flight. This form of gliding, which has been termed "gust-soaring" or dynamic soaring, has been examined theoretically by Knoller and Betz, and experimentally in the wind tunnel at Gottingen. In both cases the conclusions reached were that a not inconsiderable amount of energy was present which, with a suitable machine, should be available for flight. A few experiments with man-carrying machines have been made, but with rather inconclusive results. It should be remembered that it is very often difficult to distinguish between true "gust soaring" and gliding in a wind having, perhaps quite unsuspectedly, an upward vertical component, and that in many instances during a glide a machine may be helped partly by one and partly by the other form of energy.

Apart from the studies made in Germany, several French experimenters have attacked the problem of gust-soaring, among them being Dr. Magnan, who has made a close study of bird flight, and who has now reached a state when he feels that the theories involved are sufficiently well, although not completely, understood to justify the building of a machine for the purpose of carrying out actual flying experiments. This machine, which forms the subject of the following notes, is of unorthodox design, both aerodynamically and structurally, and for the information on which the description is based, as well as for the illustrations, we are indebted to our French contemporary, *L'Air*, of Jan. 1, 1924, in which appears an article by M. Andre Lesage dealing with the Magnan glider.*

Design Based on Bird Flight

Basing his design to some considerable extent upon the characteristics of web-footed birds, Dr. Magnan has produced a cantilever monoplane, the wing of which is of uniform chord over approximately one-half of its span, but tapering to a point at the tips. The leading edge, it will be seen, is straight and the taper is provided solely by the trailing edge.

Near the root the wing is swept down suddenly and sharply to form a pronounced dihedral angle. This angle, however, extends over but a few feet of the span, and the rest of the wing is at a smaller, although still considerable, dihedral. The wing tapers in thickness as well as in chord, and the angle of incidence is progressively altered, being in the neighborhood of 20 deg. at the root, where the wing joins the body.

In addition to the change in section and angle, the wing is unusual in that the ribs are so constructed that they are capable of being flexed to a very considerable extent under varying loads. Thus one can scarcely speak of any particular wing section in the Magnan monoplane since the number of variables is unusually great. It will be noticed from the drawings that no ailerons are fitted. Lateral control is by wing warping.

The fuselage is short in proportion to the span, and an exceptionally large portion of it projects ahead of the wing. This results in the tail being very close to the wing, only about one chord-length separating the trailing edge from the forward end of the fixed tail plane.

Constructionally no less than aerodynamically the Magnan glider is somewhat unusual.

The monoplane wing has but a single spar, of box section

* Translation by *Flight*

and built of wood. The construction of this spar must have presented considerable difficulties, as there are two fairly sharp bends in each spar, one a few feet out from the body, where the horizontal cabane meets the spar, and another (this in a horizontal plane) a few feet from the tip, where the spar tip is swept forward to meet the straight leading edge.

The ribs have top and bottom flanges of ash, the lower flange, which runs from leading to trailing edge, being screwed and glued to the lower face of the spar. The top flange stops short of the trailing edge, about one-third of the chord from it, and is so attached to the lower flange and to the spar that it can slide a short distance in a fore-and-aft direction, thus allowing the trailing edge to flex. The details of the arrangement are not available, but we understand that they constitute a patent. Near the wing tips the ribs slope outward, and also they are so mounted on the spar as to give a pronounced "wash-out" to the wing.

Lateral control is by warping, but instead of the warp causing a change of angle without sensible change in camber, in the Magnan monoplane both angle of incidence and camber are altered. It would appear that the force on the control column necessary to produce the required amount of warp must be very considerable. The fabric covering is applied in a special way, which is claimed to prevent wrinkling when the wing is being warped.

Fuselage Construction

The fuselage is of egg-shape section, and is built up of formers alternately sloping back and forward, thus forming a series of Vees as seen in side view. To these formers are attached four main longerons and a great number of stringers, and wire bracing is employed for stiffening the structure against torsion. (The Vee formation of the formers plus the four longerons already provide a structure stable under plain bending loads.) The fuselage is fabric covered except at the extreme nose and stern.

The tail is of more or less orthodox design, but is supported on a duralumin cone bolted to the rear bulkhead of the fuselage proper.

A simple undercarriage consisting of two wheels carried on a duralumin axle is fitted, the axle being sprung by rubber cords anchored inside the lower portion of the fuselage.

The pilot's seat is mounted on longitudinal rails, somewhat like the sliding seat in a boat, and for fore-and-aft control he can alter the position of the center of gravity by sliding the seat along. The ordinary controls are of the usual type.

How the Glider Will Operate

The manner in which it is hoped to carry out gust-soaring with the Magnan glider is as follows. The machine will be launched from a cliff on the coast, and will glide into the wind until fairly low over the sea. It is assumed that gusts will be present, and that these occur at such intervals as to enable the pilot to manœuver the machine in the manner required to extract energy from the fluctuations in the wind. During a gust the pilot will pull back the stick, and if necessary shift his seat back so as to bring the tail down quickly. As the gust dies down he will push the stick forward and slide his seat forward at the same time so as to avoid stalling the machine. During a lull it will be the pilot's endeavor to glide forward with the minimum loss of height, that is, at the best gliding angle for the particular conditions. As soon as he feels another gust rising he will again elevate, and so the cycle is continued with alternate elevations and depressions. Dr. Magnan considers that another method would be to glide downwind during the lulls and up wind during the gusts, but that it is doubtful if the machine could be maneuvered quickly enough to make this form of gust-soaring feasible.

Some preliminary tests over land have been made with the machine, piloted by M. Canivet, and these are stated to have indicated that the machine should, under suitable conditions, be capable of taking advantage of a gusty wind.

The main characteristics of the Magnan monoplane, known as the "Type Marin M2," are as follows: Length o.a., 16 ft. 3 in., span 37 ft. 9 in.; chord (root), 4 ft. 3 in.; wing area 110 sq. ft., weight of wing 132 lb., weight per sq. ft. of wing, 1.2 lb., weight of machine (empty) 286 lb., weight in flying trim, 440 lb., wing loading, 4 lb./sq. ft.

As alighting on the sea will be one of the normal functions of the machine, the fuselage and wings have been made watertight, the opening for the wheel axle being bulkheaded off from the rest of the fuselage. The wing loading, it will be seen, is fairly heavy, and the structural weight appears to be greater than usual in gliders.

European Air Mails

The British Postmaster-General communicates the following particulars of air mail traffic during 1923:—

"The air letter traffic on the London-Paris service remains small, the number of letters sent having been about 23,700, as against about 28,500 in 1922. On the other hand, the air letter traffic to and from Cologne has grown rapidly, from about 400 lb. during the first quarter of 1923 to over 4,000 lb. during the third quarter. This tenfold growth is largely to be attributed to the partial dislocation of the ordinary mail service with Cologne caused by present conditions on the Rhine. The total weight of the letter air mails to and from Cologne throughout the year was nearly 10,000 lb., representing some 142,000 letters. During the latter part of the year the weight of the inward air mail was over four times that of the outward. Air mail letters to Holland increased from about 9,600 for eight and a half months of 1922 to about 22,000 in 1923, an increase at the rate of about 6½ per cent.

"The weight of parcels sent to Paris during 1923 by airplane amounted to about 23,700 lb. (10½ tons), as against about 18,700 in 1922. The air parcel traffic to Holland increased substantially during 1923, and amounted for the whole year to about 11,000 lb. as against about 5,200 lb. during seven months of 1922.

"About 315,000 letters in all are estimated to have been carried by the Cairo-Bagdad Air Mail in 1923, as against about 175,000 in 1922—an increase of 80 per cent.

"The only non-British Air Mail service of which appreciable use is made by the public in this country (Great Britain) is that from Toulouse to Casablanca (Morocco), for which about 17,000 letters were posted in 1923—an increase of about 85 per cent over the number (9,200) posted in 1922."

England to Race in Beaumont Cup

The Commodore Beaumont Cup race for high speed airplanes which was to be held on June 15, next, at Istres, near Marseille, France, provided at least one foreign country would enter, will duly take place as scheduled, the Aero Club of Great Britain having lodged an entry with the Aero Club of France.

The British entry will be built by the Gloucestershire Aircraft Co. to the designs of H. P. Folland, designer of the previous Gloucester racers. Mr. Folland recently made experiments with wing sections similar to those used on the American racers last year at St. Louis, and he hopes to obtain similar speeds as those obtained in this country. It should be noted that the fastest British machine built so far, the Gloster, has a speed under 200 mi./hr., or nearly 70 m.p.h. less than that of our own world's record breakers, built by the Curtiss Aeroplane & Motor Co. of Garden City, N. Y.

The French entrants are Ferbois, Nieuport-Astra and Salmson-Becherau.

French Light Plane Qualifications

The French air department has decided that all aircraft competing in the Tour de France des Avionnettes, which will be held next summer, will receive special airworthiness certificates. The conditions under which the usual airworthiness regulations will be modified for this purpose have been issued in booklet form, which may be obtained from the Secretariat de l'Association Française Aérienne, 40 Quai des Celestins, Paris, France.

The perusal of this booklet is recommended to all those concerned with the development of low powered airplanes.

Air Power and Naval Conservatism

By REAR ADMIRAL W. F. FULLAM (Retired), U.S.N.

(By Courtesy of the Cosmopolitan News Service)

The Navy and the nation have been menaced for three years by naval conservatism. This unfortunate condition prevented the adoption of an enlightened and modern policy in 1920, when certain officers, some of whom are still in prominent positions in the Navy, discouraged, if they did not actually prevent, the development of submarine and air forces, without which no navy can hope for victory in the next naval war.

It is true that some of these officers have recently shown signs of a retreat; but they are leaving a strong rear guard behind them while endeavoring to prove that they can see into the future.

Erroneous Statements

There have been three pronouncements of late by conservative officers that unmask their positions. One Admiral wisely exclaims that the airplane is not a "weapon;" it is a mere "vehicle!" This is not a very damaging impeachment of the airplane, because the battleship, the cruiser, the destroyer, and the submarine are "vehicles" also. Each carries various weapons, and it is pertinent to remark that each and every one of them can be, and have been, sent to the bottom or destroyed by the weapons carried by the airplane. The latter, therefore, stands high among naval vehicles!

The next statement to which serious objection must be taken was made by an officer at one time connected with the Office of Naval Intelligence, strange as it may seem. He stated that the sum of $1,800,000,000 had been expended upon air forces of the Army and Navy, and that we were today deficient in airplanes. Now let us analyse this remarkable statement. Official data shows that Congress since 1916—eight years ago—has appropriated $406,417,000 for naval aviation purposes. Of this amount, however, $123,000,000 was returned to the Treasury or transferred to the Naval Supply Fund—leaving $283,000,000 as the total amount obligated for the Bureau of Naval Aviation. But it is fair to remark that this amount included the salaries of all civilian personnel connected with aviation since its inception; the establishment and upkeep of air stations before, during and since the war; in fact, everything except the pay of naval officers and men! It is clear that such moneys should not be charged against "aviation" any more than we should charge the cost of all our Navy Yards, training stations, gun foundries and the whole civilian force employed by the Navy, against our battle fleet! It's a very poor rule that doesn't work both ways. *In truth, the money appropriated for actual aviation since 1916 is a very small percentage of the annual naval appropriation.*

Actual Aviation Expense

In 1916, only $1,000,000 was appropriated; in 1917, $3,500,000—less than the cost of two destroyers; in 1922, only $13,000,000; and similar amounts in 1923 and 1924. It is safe to say that including all the actual expenses, the direct expenditures for naval aviation during the World War and *since 1916* was less than $200,000,000.

Now as regards the Army, the total amount appropriated has been about $560,000,000. Subtracting from this the cost of Army stations, landing fields, civilian personnel and other items that have nothing whatever to do with fighting forces, and taking into account material now on hand or which has been transferred to other Departments (the value of which should be credited to the Army Air Service), the sum of $380,000,000 remains chargeable to Army aviation. Indeed, if all expenses which had nothing whatever to do with the fighting forces at home or in France were deducted, this amount would be reduced still further. In short, we may say that strictly speaking not more than $500,000,000 has been expended on Army and Naval aviation since 1916. *This is less than one-third the amount as given by the naval officer.*

RECORD OF REAR ADMIRAL FULLAM

Rear Admiral Fullam entered the Naval Academy in 1873, fifty-one years ago.

He graduated in 1877 at the head of his class, and cruised in all seas and in all types of ships, from sailing ships to Battleships. He has spent twenty-four years of his life on board ship and was a watch officer on board the cruiser New Orleans in the Spanish War on the blockade and in the bombardment off Santiago and Porto Rico.

On shore he has commanded the Naval Stations at Newport and Great Lakes, and was Superintendent of the Naval Academy in 1914-1915.

Admiral Fullam was Senior Officer in command of U. S. Forces in the Pacific during the World War. He holds all service campaign medals, including the Navy Cross for distinguished service in the World War.

For the year ending July 1, 1924, the Army will have spent $12,400,000 for aviation purposes. In other words, the appropriation for Army and Naval aviation combined for the current year will be *far less than the cost of one battleship.*

Contradictory Estimates of Air Power

The third statement made by an officer of strongly conservative views is strangely contradictory. He says, very truly and with commendable intelligence: "In the future a fleet without adequate naval aviation to support it will be *only half a fleet*, and will be an easy victim for an enemy having power in ships which are properly supported by their own air units." It is a pity that this officer did not stop right here, but he goes on to state, in deprecation of air forces, that a fleet can attack a coast under cover of bad weather—mists, fog, etc.—when air forces cannot attack it. This is an amazing statement. Imagine a fleet bombarding a coast in a fog! Suppose the fog were to clear away suddenly! What would the fleet do then? It appears that a fleet is to depend upon bad weather to protect it from airplanes! What a humiliation! He furthermore declares (referring to the bombing experiments which have sent old battleships to the bottom in a few minutes), "I assure you that the logical deductions from these experiments have been perverted. More than anything else the experiment demonstrated that modernized battleships are immune to an unexpected degree against bombs of great size." Now if this latter argument is sound, how can we say that a fleet without aviation is "only half a fleet?" If the enemy's fleet can attack us with impunity under cover of bad weather, *and if these battleships are immune from bombing attacks, how can we say that aviation is such an important element of a fleet?* We cannot carry water on both shoulders. And this is what the conservative officers of the Army and Navy are attempting to do today. Admiral "Face Both Ways" will never get the Navy anywhere—except perhaps to the bottom of the sea.

Beatty and Von Scheer

It is interesting to note that conservative officers in other nations are also beginning to give way. Admiral Earl Beatty, the First Sea Lord of the British Admiralty, while still clinging to the belief that the "capital ship" as he says, is of supreme importance, declared: *"But the capital ship of tomorrow is not necessarily the battleship! It may be something that can fly, dive, or perform other evolutions* which

today seem impossible." It is quite significant that Admiral Beatty has made this admission This is the most that any enthusiastic advocate of air power and submarine power can claim—*that the battleship of today may disappear from the sea in years to come!*

It is also pertinent to remind the reader that Admiral Von Scheer, who commanded the German fleet opposing Admiral Beatty at Jutland, has stated that the battleship "no longer commands the sea," and that it would be quite impossible for a nation to send its battle fleet across an ocean if opposed by dominating air forces and submarines.

There is but one reason or excuse for the resistance of conservative Naval Officers to the full recognition of air forces and submarines—they are fearful that in advocating these new weapons the value of battleships will be lessened in the eyes of Congress and the people But this fear is not justified. And even if it were this ghost should not frighten them. We now have eighteen splendid battleships. We are forbidden to build more during the ten year holiday In that interval we may be sure that the people, the Congress, and let us hope the conservatives themselves, will see the light of day. The truth may be made plain to all. If we continue the development and experiments with new weapons during the next ten years, we shall be able to wisely re-evaluate all naval weapons—the new and the old as well—and keep our Navy up to date. In other words we can lose nothing and we may gain much It is more than probable that the recent progressive pronouncement of Admiral Earl Beatty—*that the battleship of today may not be the capital ship of the future*—will prove to be true If so it will have been very sensible to avoid wasting money on an old type Our money will have been saved to build modern fighting ships.

The Navy in Danger

The harm to the Navy in this depreciation of air forces and submarines and the fearful fear that the battleship will suffer in estimation at this time is found in the danger *that Congress will withhold appropriations from the weapons we so sadly need.* In this case our battle fleet will be, (in the words of our conservative half-awake Captain) *"only half a fleet and will be an easy victim for an enemy having power in ships which are properly supported by their own air unit."* This is the danger the United States faces today Conservatism has brought us to it It will require ten years' concentrated effort with generous appropriations to supply our helpless surface fleet with the submarines and air forces it needs today. It is to this dangerous situation that backward-looking officers and statesmen have brought us. The records will impeach them They have no time to lose if they are to escape ultimate condemnation.

Air Force and Navy in England

For some time past an insistent propaganda has been conducted in behalf of the British Admiralty to have the sea-going branch of the Royal Air Force dissociated from the latter, and attached to the Navy The following passages from an editorial in Flight (London) shed much light on these attempts which have once more been defeated by a specially appointed sub-committee of the Committee on Imperial Defense:

"For several years now controversy has centered round the 'One Service, one uniform, one badge' problem, originally and for so long advocated in the pages of Flight, as the one and only healthy solution of the most efficient working of the Royal Air Force. Not unnaturally, perhaps, having regard to human nature, prejudices and traditions in the older Services have loomed large in the arguments for and against a separate Air Service, the main feature of which, in most cases, has been a *non possumus* attitude by reason of the custom since Nelson's or Wellington's time having held good in some other groove

"For the credit of the War Office, those in high places were quick and willing to recognize the entirely new set of circumstances which the element of the Air had brought into being From the first month in the War, Army commanders grasped the help of the Air Arm with both hands, and, as history has recorded, some of the Allies' most critical situations at the time of the German break through Belgium were saved by utilizing the services of the airplane.

"On the other hand, the Admiralty, from the first, refused to regard the realm of the Air other than from a contemptuous aspect, with the result that their attitude was reflected throughout the Navy down to the lowest unit.

"Had the Admiralty early taken the Air Force seriously in like manner to the War Office, there might have been quite a different series of happenings to record in the history of the Great War, as it will ultimately be handed down to posterity All too late, it dawned upon a few of those who had the power to move in matters strategic, that there really might be something in these beastly things after all, with the result in the later phases of the War that advantages which were lost through negligence of aircraft in the earlier stages, were strikingly in evidence with the assistance of the Air Arm.

"When a repentant repents, he usually repents wholeheartedly, and so, it may be conceded that the Admiralty having at last 'repented' of its former attitude toward aviation as a real factor in strategy, whether with land or sea forces, was most anxious to see that from thenceforward every opening for the employment of aircraft should be utilized in the movements of the Grand Fleet. Not that this 'repentance' was in any way broadcasted to the world. On the contrary, it was kept a profound official secret, so far as it was possible, having regard to the requisition of R.A.F cooperation.

"Where the cat was observable emerging from the bag was in the sudden anxiety of a number of backers of the Admiralty to create, in various ways, an atmosphere of the Air Arm being of no use whatever to the Navy, except in an entirely dissociated form from the Air Force. All the Air Force was fit for was to fool around with the Army. The Navy Air Section must be entirely distinct and independent of any cooperation with any other section of Imperial Defence, no matter how its functions might be duplicated and its work overlap the efforts of the R A F, to give the best results in the Air for the national interests. No stone has been left unturned since the Armistice to carry on this campaign for a separate Air Force for the Navy, but, fortunately, wiser counsels have prevailed with those who have had the last say on Imperial questions, and each time when a new source of attack has been advanced, the result has always been the same—*an emphatic refusal to allow anything but a separate and single Air Force.*"

Illustrated Lecture on the Arctic

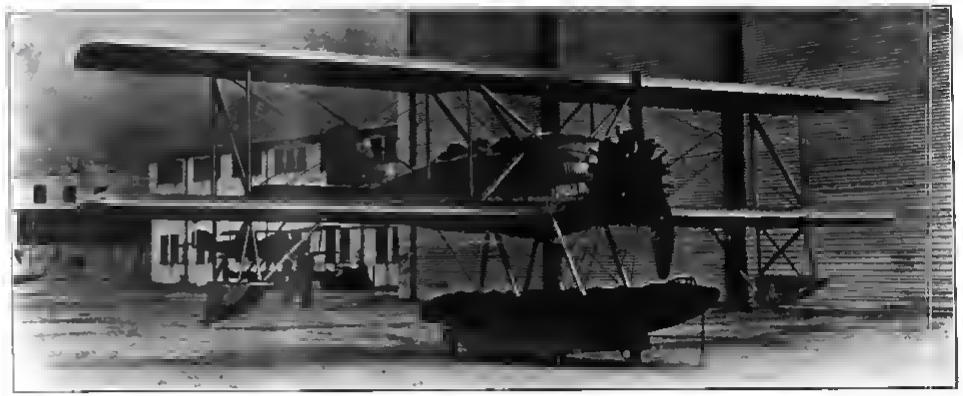
An illustrated lecture on the Arctic, with particular reference to the projected exploration of the Aretic basin by Naval aircraft, was recently given by Lt. Comdr Fitzhugh Green, U S N., before an audience composed of Navy Department officers and invited guests in the auditorium of the Interior Department.

Commander Green's lecture was based on his personal experiences during three years of Arctic exploration with Capt. Donald B Macmillan The lecture was illustrated with colored lantern slides.

Commander Green pictured the Arctic summer both verbally and through photographic testimony as a season of comfort and friendly environment. He cited the firm conviction among explorers that land exists in the unexplored area lying between Alaska and the North Pole as justification of the proposed aerial voyage of exploration by the Navy and pointed to the economic advantages that would accrue to the nation which made good their claim to such land. "Every one who examines the map of this part of the earth's surface in the light of the surrounding geographical configuration recognizes that air commerce between the capitals of Europe and the Orient is a matter of a very few years The discovery of land in the unexplored area of the Arctic would make such commercial air routes immediately practicable," he said. He stated that five countries are planning expeditions into this region during the coming summer, and spoke of the economic considerations which should urge the United States toward exploitation of commercial routes which pass by the threshold of its territory.

Success of Boeing Naval Training Plane

Navy Selects New Wright Engined Plane to Do the Work of Three



The new Boeing naval training plane (200 hp Wright J3 engine) which won the Navy's training plane competition at Pensacola naval air station

A new training plane for student Naval Aviators has been selected by the Navy, to take the place of three previous training types. The new plane, the Boeing Training plane, is equipped with inter-changeable landing gear, so that it can be used either as a landplane or as a seaplane The plane is also suited for use as a gunnery training plane. The three planes that it will supersede—the N9 seaplane, the HS2L seaplane and the JN4 landplane—have all been in use in Naval Aviation for many years, and are now obsolete. These planes were developed during the early years of the war and have outlived their usefulness as training planes for aviators destined to operate modern equipment

The Boeing training plane was selected by a special board of officers at the Naval Air Station at Pensacola, Fla. and emerged victorious from a series of tests that were made with it and three other types. During these tests the planes were flown by the instructors of the aviation training classes at the station, and instruction was actually carried on in all types. All points of construction and performance were carefully compared and it is felt that the plane selected will prove a most serviceable type.

Following training in the Boeing plane, the student Naval Aviators will be qualified to continue their training in service types of planes, such as are used from day to day throughout the Naval service

The Boeing plane, besides its interchangeable landing gear, has a number of other advantageous features The construction of the framework of the fuselage, or body, of the plane is of tubular steel The upper and lower wings, together with the right and left ailerons and elevators, are interchangeable, thus making the question of spare parts very much simpler. The plane has two cockpits, one for the instructor and one for the student, and the visibility from both of these cockpits is excellent The plane lands at a very moderate, and therefore safe, speed, of about 35 mi /hr The plane is also able to take off quickly, and when in the air handles very well The landing gear for seaplane work is of the single pontoon type. The plane is powered with a Wright J3 (Lawrance type) engine of 200 hp.

A contract for the construction of fifty of these planes has been let by the Naval Bureau of Aeronautics with the Boeing Airplane Co , of Seattle, Wash

Air Service Contributions to Army Relief

As a result of flying exhibitions held at various Air Service fields last fall for the benefit of the Army Relief Society, the Chief of Air Service was enabled to forward to the president of that society a check for $59,814.90. Flying exhibitions were held at Selfridge Field, Mich , McCook Field, Ohio; Langley Field, Va.; Logan Field, Md ; Maxwell Field, Ala.; Scott Field, Ill.; Mitchel Field, N. Y., Kelly Field, Tex.; Bolling Field, D C ; and Chanute Field, Ill

General Patrick has expressed his appreciation for the excellent manner in which the several exhibitions were conducted and the enthusiasm manifested in raising such a substantial sum for the Army Relief Society

The following letter of acknowledgment was received by the Chief of Air Service from Mrs. Henry L. Stimson, President of the Army Relief Society:

"I beg to acknowledge with deepest appreciation the receipt of your kind letter containing the check for $59,814.90—a truly magnificent gift of the Air Service to the Army Relief Society. The accomplishment of the Air Service in raising this large sum is magnificent It will be difficult indeed for any other arm of the service to surpass or equal it

"We congratulate most heartily the commanding officers of your several stations and all their men and women, whose untiring efforts made 'Army Relief Day' the great success it was.

"Assuring you that it will be more than ever our sacred duty and privilege to promote the welfare and comfort of those dependents of the men who have lost their lives in aircraft accidents, and that it has been a great inspiration and encouragement to us to have your splendid help and cooperation."

In addition to the flying exhibitions held at Army Air Service Fields, an exhibition for the benefit of the Army Relief Society was staged at Ashburn Field, Chicago, Ill., on Nov. 11, which netted the sum of $15,000

Technical Features of the International Air Races

Dayton, Ohio, Oct. 2-4, 1924

Complementary to the article printed in our last issue in which the program of the International Air Races to be held in Dayton Oct 2-4, next, was reviewed, there is given below a summary of the chief technical conditions of the various racing events, as contained in the first edition of the regulations.

"On to Dayton" Race

Event No 1

This contest is open to any type or make of aircraft provided it is entered by civilians. Competing planes must be flown from a point 200 mi. or more (air line) from Wilbur Wright Field, Fairfield, Ohio. The flight may start at any time after Sept 20, 1924. The finishing time will be taken when the pilot delivers his Flight Log at the Contest Committee headqoarters, at Wilbur Wright Field. This must in any case be done before midnight, Oct. 1.

Contestants will be placed, and prizes awarded according to the following four charts:

Average Speed Based on Total Elapsed Time—Average speed will be determined by dividing the air distance between points of departure and Wilbur Wright Field by total elapsed time.

The maximum number of points to be awarded on average speed is 100. For example: A plane making the flight at an average speed of 150 mi./hr will be awarded 100 points, and for each mile per hour less than 150 mi./hr, it will be credited with one point less, except that no points will be awarded for average speeds of less than 50 mi./hr.

Distance Covered—In order that pilots flying from distances greater than 500 mi. may not be penalized by having to land and take on extra fuel with the resultant reduction in average speed, based on elapsed time, the following points will be awarded on total air line distance covered.

Planes starting at a point 500 mi. from Wilbur Wright Field will be awarded no points. Planes will be awarded one point for each additional 10 mi. above the 500 mi. specified.

Passengers Carried—Competing planes will be awarded 10 points per passenger carried, with a maximum of 100 points. Passengers must average 140 lb. each.

Engine Horsepower—This will be determined at the rate of 4 cu. in. displacement per hp. A maximum of 200 points will be awarded to the plane completing the flight propelled by an engine of 10 hp. or less. For each additional 10 hp. (40 cu. in. displacement) the contestant will be credited with 5 points less. Maximum horsepower allowed, 400 hp., will be given 5 points only.

The cu. in. displacement will be that obtained from the McCook Field report for the make of engine used.

Prizes will be awaeded on the total number of points received by contestants. In case of a tie, the winner will be determined by lot.

Pilots are urged to report *by telegram* to the Contest Committee Headquarters at Wilbur Wright Field when they expect to depart, forced landings, temporary or permanent disability, and particularly if delay compels their arrival at night. Landing lights cannot be guaranteed.

Pilots must carry a log in which the following entries must be made in ink or indelible pencil: (a) Signatures of passengers carried; (b) Cu. in. piston displacement of engine used; (c) Point of departure, (d) Date and time of departure (Standard time at point of departure).

Two responsible persons are required to witness the departure and certify by their signature that items a, b, c are correct, and that the plane did not take off before the time as entered in log.

Free-for-All Race for Two-Seaters

Event No. 2

Only civilians can compete in this race, which will be held Oct. 2.

Engine must have a piston displacement of 510 cu. in.* or less. (Figures furnished by the Engineering Division of the Air Service at McCook Field will be accepted as standard.)

At the time of entry the entrant must supply the Contest Committee with a statement giving the bore, stroke, and cu. in. displacement of the engine to be used in the race, this statement to be properly executed before a notary public.

All airplanes must carry a total load of 340 lb. to consist of pilot and one passenger, with sufficient ballast, if necessary, to bring their weight up to the required amount. Under no consideration may open cockpits be covered.

This race will be flown over a distance of 90 mi., six times around a closed course of 15 mi., starting at Wilbur Wright Field.

Free-for-All Race for Two, Three, or Four-Seaters

Event No. 3

Only civilians can compete in this race to be held Oct. 2.

Engine must have a piston displacement of 800 cu. in.† or less. Figures furnished by the Engineering Division of the U. S. Air Service.

At the time of entry the entrant must supply the Contest Committee with a statement giving the bore, stroke, and cubic engine displacement of the engine to be used in the race.

All airplanes must carry a total contest load of 340 lb., to consist of pilot and one passenger, with sufficient ballast, if necessary, to bring their weight up to the required amount. Under no consideration may open cockpits be covered.

The distance to be flown is 120 mi., eight times around a closed course of 15 mi., starting at Wilbur Wright Field.

Liberty Engine Trophy Race

Event No 4

This race, for observation type (two-place) airplanes, will be held Oct. 2.

Conditions of contest are as follows:

Load factor of wing cellule, as loaded for start of race, to be 6.5 high incidence condition, and 4.5 low incidence condition,

Air speed greater than 90 mi./hr;

Total wing area must be greater than 350 sq. ft.,

Cockpits must be left open, all other forms of streamlining permitted;

Carry the following "contest load," and, in addition, crew 340 lb. Contest loads shall be determined from the following formula, using as a basis the cubic inch displacement for the 400 hp. Liberty engine.

$$\frac{400}{1649} \times \text{cu. in displacement of motor used} \times 0.85 = \text{Contest Load.}$$

Contest load shall consist of shot bags obtainable at Contest Committee Headquerters, and must be checked and weighed on contest scales after the race.

Fire extinguishers and parachutes may be included in the "contest load," however, fixed instruments, gas, oil, and water for the course are excluded. Bomb racks, guns, and mounts may be removed.

The distance to be flown is 180 mi.—twelve times around a closed course of 15 mi., starting at Wilbur Wright Field.

Malvihill Model Trophy Contest

Event No 5

No restrictions on the design of the model except that they shall have a wing span not to exceed 40 in. All models must be hand launched and the only motive power will be that derived from the use of rubber bands.

*Approximately 130 hp.
†Approximately 200 hp.

The contest shall be for duration. A contestant will be allowed a total of three official flights. He will be accredited with the greatest elapsed time made in any one of his three flights.

A contestant will be allowed a maximum of three models, and he may use any or all to complete his official three flights. He will be allowed five minutes within which to launch his model. Should he fail to launch his model within the time allowed, he must withhold that official trial until his next turn in line. Any flight under 10 sec. will not be official and is subject to the rules of a delayed flight.

No contestant may take part in the contest for this trophy unless he is a member of the Junior Flying League of the National Aeronautic Association, and in good standing. He must also be the owner and builder of the model submitted; however, the design for the model may be obtained from other sources than his own. He shall be the builder of the entire model with the following exceptions: Propellers, motor bearings and propeller shaft; also such other small metal fittings as may be used in the construction of the model may be purchased from outside sources.

Aviation Country Club of Detroit Trophy Race

Event No 6

This light commercial speed and efficiency race for civilians only, will be held Oct. 3.

The conditions of contest provide for (1) Average air speed greater than 80 mi./hr. in race, (2) Factor of safety of wing cellule as loaded for start of race: 4 low incidence condition and 6 high incidence condition, (3) Engine or engines must have a total piston displacement not to exceed 800 cu. in.*; (4) All airplanes must be constructed to seat, comfortably, a pilot and at least two passengers. Under no consideration may obviously open cockpits be covered during the race, but this does not eliminate "cabin" type fuselage.

The distance to be flown is 120 mi., eight times around a closed course of 15 mi., starting at Wilbur Wright Field.

The winner of the speed contest shall be the pilot who has completed the full course in the shortest elapsed time.

The winner of the efficiency contest shall be the pilot who has completed the full course with the highest figure of merit based on the following formula

$$\frac{W}{HP} \times M.P.H. = \text{Figure of Merit}$$

W = Weight of load passengers.

HP = Horse-power credited contestant = $\frac{\text{cubic inch displacement}}{4}$

$M.P.H.$ = Average speed of completing race in miles per hour (must not be less than 50 mi./hr.)

The contest load shall consist of pilot and passengers at 170 lb. each or shot ballast in lieu of passengers.

Dayton Daily News Light Plane Trophy

Event No 7

The Dayton Daily News Light Airplane Trophy race, to be held Oct. 3, shall be competed for by light airplanes, with engines having a total piston displacement of 80 cu. in.† or less.

Army and Navy planes will not compete in this event.

The minimum weight for pilots will be 150 lb. In case the pilot weighs less, shot ballast shall be placed in the cockpit to make up this poundage.

General conditions and design of plans to be such that in the opinion of the Contest Committee it is safe and not a menace to other contestants or spectators. The Contest Committee reserves the right to refuse to admit any airplane which does not comply with these requirements.

The distance to be flown is 25 mi.—five times around a closed course of 5 mi., starting at Wilbur Wright Field.

Dayton Chamber of Commerce Trophy

Event No 8

This trophy, donated by the Dayton Chamber of Commerce, will be competed for on Oct. 3 by large capacity airplanes capable of carrying a pay load of 2,000 lb. or over, and shall become the permanent possession of the entrant of the winning airplane. This race is open to civilian and military planes.

*Approximately 200 hp.
†Approximately 80 hp.
‡Approximately 20 hp.

The conditions of contest furthermore provide for (1) Load factor of wing cellule as loaded for start of race: 4 high incidence condition and 3 low incidence condition, (2) Air speed greater than 85 mi./hr., (3) Total wing area must be greater than 600 sq. ft.

All airplanes will carry a contest load in addition to crew 340 lb.; also gas, oil, and water sufficient for the race.

The contest load shall be determined from the following formula, using as a basis the cubic inch displacement for the 400 hp. Liberty engine

$$\frac{400}{1649} \times \text{cubic inch displacement of engine or engines used} \times 2 = \text{"Contest Load."}$$

The distance to be flown is 150 mi., ten times around a closed course of 15 mi., starting at Wilbur Wright Field.

Detroit News Air Mail Trophy

Event No 9

The race for this trophy is restricted to Air Mail pilots flying regulation Air Mail planes equipped with the Liberty engine.

The conditions of contest provide for (1) Load factor of wing cellule as loaded for start of race: 4 low incidence condition and 6 high incidence condition, (2) Air speed greater than 90 mi./hr., (3) Capable of carrying pay load of 800 lb. or over, (4) All airplanes, in addition to the pilot, must carry gas, oil, and water sufficient for the race.

The distance to be flown is 300 km. (186.42 mi.), six times around a closed course of 50 km. (31.07 mi.), starting at Wilbur Wright Field.

Speed and Efficiency Race for Light Airplanes

Event No 10

The conditions of contest provide that (1) Army and Navy planes will not compete in this race; (2) Engine must have a total piston displacement of 80 cu. in. or less; (3) All planes must carry a total load of 150 lb., this load to consist of pilot and shot ballast if necessary; (4) Gas tanks must be completely filled and sealed by the Contest Committee before the race.

The distance to be flown is 50 mi., ten times around a closed course of 5 mi. starting at Wilbur Wright Field.

The winner of the speed contest will be the pilot who has completed ten laps of the course (50 mi.) in the shortest elapsed time.

The winner of the efficiency contest will be the pilot who has completed ten laps of the course (50 mi.) with the highest figure of merit according to the following formula, providing the pilot places in one of the four positions in the speed portion of the contest.

$$\text{Figure of merit} = \frac{\text{Speed of completing race in mi./hr}}{\text{Gasoline consumed}}$$

The gas tank seal will be broken by the Contest Committee on completion of the race, and each plane will be credited with a gas consumption equal to the amount required to completely refill the tanks.

A bonus will be paid to the entrant of each airplane finishing in one of the four positions in the speed portion of the contest. This bonus will be paid at the rate of $10.00 for each cubic inch provided the displacement of the engine used is less than 50.

Brig. Gen. William A. Mitchell Trophy

Event No 11

This race, for pursuit type planes, is a closed event for pilots of the First Pursuit Group. It will take place on Oct. 4, preceding the Pulitzer Trophy race.

The distance to be flown is 200 km. (124.27 mi.) four times around a closed course of 50 km. (31.07 mi.) starting at Wilbur Wright Field.

Pulitzer Trophy Race

Event No 12

The Pulitzer Trophy race, to be held Oct. 4, is an international event for high speed airplanes having an air speed greater than 175 mi./hr., as loaded for start of the race, and a stalling speed not exceeding 75 mi./hr.

The following load factors are provided for in the regulations regarding the wing structure. A load factor of 7½ in high incidence condition with center of pressure at its most forward position, (2) a load factor of 5 at low incidence condition with center of pressure at location corresponding to maximum ground speed, (3) A load factor of 4 in reverse load condition.

For the fuselage a load factor of 7 is provided with flying and landing loads.

The strength values for wood as given by the U S Forest Products Laboratory for 10 per cent moisture content and the U S Army method of stress analysis shall be used in making all strength calculations.

Sufficient tankage must be provided for the Pulitzer route plus 33⅓ per cent reserve fuel This amount shall be based upon engine consumption, as determined from approved dynamometer test and estimated length of time required to complete the race

Each entry must be accompanied by a properly drawn and certified statement giving the fuel consumption of the engine at the maximum revolutions per minute to be used in the race

Visibility and maneuverability (land and air) shall be such as not to be in opinion of the Contest Committee a menace to other contestants or spectators.

All planes entered in this race must be so designed with proper exhaust manifolds, shields, deflectors, ventilators, or other design characteristics, which, in the opinion of the Contest Committee, will prevent exhaust gases from reaching the pilot during flight Any plane not so equipped or designed will be subject to disqualification

All planes in this race must leave the ground under own power only, must not discard any part of their equipment in flight, and must have proper landing equipment attached at all times

The machine loaded as indicated below must be weighed by the Contest Committee not later than three days prior to the day of the race, and weight checked against the data submitted by the entrant

The distance to be flown is 200 km (124 27 mi.), four times around a closed course of 50 km. (31 07 mi.)

The theoretical stalling speed shall be calculated theoretically, and it is a condition of this contest that each entrant file with the Contest Committee, not later than thirty days prior to the contest, the following data:

(a) The weight of the airplane ready to fly including a pilot at 180 lb., but not including the weight of 33⅓ per cent excess of gasoline The excess weight of tankage to provide for the additional gasoline shall not be deducted from the weight of the airplane

The stalling speed shall be calculated by the following formula:

Stalling speed in mi./hr =

$$\sqrt{\frac{\text{Weight of airplane in lb.}}{\text{Wing area in sq. ft} \times K_Y \, max}}$$

In this formula $K_Y \, max$ shall be determined as provided below.

(b) Accurately dimensioned profile of section or sections used, and wing area in square feet. The total wing area shall be taken as the projected area of the freely exposed main surfaces, from root to wing tip, on the plane of the X and Y axes of the airplane. The thrust line may be considered as the X axis. Axle fairings, if of a lifting section, may be included as wing area.

(c) Characteristic curve showing maximum K_Y given by a test of a rectangular wing model of the airfoil section or sections used, 3 in x 18 in. in size In the case of tapered wings, wings with wash-in or wash-out built into the wings, or arrangement other than a straight airfoil, the model shall be geometrically similar to the actual wing used and have an area of approximately 54 sq. in.

The stalling speed shall be calculated from the maximum K_Y obtained on the model. No corrections such as speed scale, aspect ratio, biplane, stagger, etc., will be allowed.

All wing models must be tested under uniform conditions at a speed of 40 mi./hr. in the same wind tunnel selected by the Contest Committee of the National Aeronautic Association

(d) If, after the airplane has been weighed in accordance with these regulations, and checked against the model characteristics submitted, the theoretical stalling speed shall be found in excess of 75 mi./hr., the airplane will be penalized in the race at a rate of 4 mi./hr. for each mile an hour the stalling speed is in excess of 75 mi./hr The permitted theoretical stalling speed of 75 mi./hr. shall not be exceeded by more than 3 per cent without total disqualification.

The Pulitzer Trophy is open to foreign competition under the following conditions

(a) Any Aero Club holding membership in the F.A.I. may enter one or more airplanes.

(b) The Aero Club represented by the pilot of the winning airplane shall conduct a contest for the Pulitzer Trophy within twelve months from the date of the last contest. Contest must be run under existing regulations.

(c) Location and date of contest must be announced six months in advance

(d) If the winning club is unable to conduct a contest for the Pulitzer Trophy within twelve months then this club forfeits the right to hold the trophy which shall be returned to the National Aeronautic Association which will be charged with organizing the next annual contest.

(e) The trophy shall not be considered as having been won unless a competitor completes the course

(f) In case the holding club passes out of existence the trophy shall revert to the National Aeronautic Association of U S A or in its default to the donors—Messrs. Ralph Pulitzer, Joseph Pulitzer, Jr. and Herbert Pulitzer

General Regulations

The following general regulations apply to all flying events in the Dayton air races

No pilot may take part in any race who does not possess the Fédération Aeronautique Nationale Aviator's Certificate *and* annual license issued by the Contest Committee of the National Aeronautic Association. Certificate and annual license must be shown to the race officials on demand.

Any contestant breaking the rules of the race, or subsequent ones which may be sent out in writing, shall, upon recommendation of the judges, be disqualified

Pilots must taxi and fly on the same predetermined course, and must not cross or attempt to cross in front of another plane during the take-off A plane overtaken in the air must hold its altitude and true course. A plane overtaking a slower plane shall not pass or attempt to pass between that plane and the turning pylon or balloon All pylon turns will be made to the left Pilots shall pass outside of all turning points in plain view of officials stationed at each point

Any competitor who has failed to turn a pylon properly may validly continue on the circuit, provided he makes a complete turn of the said pylon and then continues his trip in the same direction (F.A.I. Regulations, Art. 115)

No protest shall be considered unless presented in writing to the Contest Committee within 24 hr. after the finish of the race (F.A.I. Regulations, 78, 79 and 80) Appeals: See F.A.I. Regulations, Art. 178-179)

Each airplane shall have a number assigned to it by the Contest Committee, which shall be painted on the bottom surface of the lower wing and on each side of the fuselage clear of the wing, in characters as large and clear as possible. It shall not have other numbers or lettering over 12 in. in height.

Competitors are forbidden to display on their aircraft any commercial advertisements except the trademark of the constructor of the apparatus (F.A.I. Rules, Art. 89)

Wright Corp. Pays Dividend

The Wright Aeronautical Corp. of Paterson, N. J., declared on Feb. 6 a dividend of 25 cents per share on the outstanding capital stock of the corporation.

AIRPORTS AND AIRWAYS

Dayton News

By Maurice C. Hutton

A frozen camshaft, which prevented the exhaust gases leaving through the proper manifold, thereby cutting down operation of the supercharger, forced Lieut. John A Macready, of Dayton, Ohio, to abandon his second attempt to break the altitude record of the world on Feb 22. The pilot reached an altitude of 34,983 ft in the veteran LePere biplane, which was 2,000 ft below the mark necessary to break Sadi Lenointe's record in France.

"The flight was uneventful except when the camshaft finally jammed," Lieutenant Macready reported with a smile on landing "I thought it was an explosion and involuntarily looked around to see if anything had happened to the plane. At the same time I glanced down to see if my parachute was hooked on all right."

Orville Wright witnessed the flight as a certified representative of the Fédération Aéronautique Internationale Other observers were L. Lnzerne Custer, manufacturer of aeronautical instruments, and Major Frank B Hale, of Dayton The flight was made at McCook Field.

A cloudless sky and a bright sun beamed on the squat altitude ship as she was rolled on the line on Washington's Birthday. It was a holiday for the Engineering Division and everything else was comparatively quiet. Al Berger, of the Supercharger Research department, gave the device a final "once over" while Roy Langham, instrument specialist, stowed the five barographs away. Mr. Langham has taken part in numerous altitude flights, including the one during which Lieutenant Macready set an unofficial record for two men. He was also a passenger in the ship in which Lieut. Leigh Wade set an altitude record for twin-engined craft

Lieutenant Macready calmly dressed in his office while this work was being done. He slipped on four pairs of woolen socks before donning his electrically heated flying suit. Mr Langham added the final bit of equipment which consisted of the mask through which the liquid oxygen is breathed A few minutes later, at 9:33 a. m., the ship nosed sharply into the sky and the flight was on.

Several minutes of sharp climbing and the airplane disappeared in the blue. Sometime later an Airways ship shoving off for Washington, D. C., brought the observers from a warm office in belief that Lieutenant Macready had suddenly turned back. About a half hour after the altitude flier took off the observers were treated to the rare sight of exhaust gases from the LePere condensing A thin stream of smoke was all that was visible but it revealed that the pilot was still climbing The ship came back about 2 hr later with the motor practically dead It stopped in the middle of the field after a short roll

Lieutenant Macready reported his altimeter showed an altitude of 41,000 ft. but that he was disappointed in the results. He expressed the desire to make another attempt offering the belief that the LePere with the new supercharger rated to give sea level pressure at 35,000 ft, is capable of breaking the present record

Two recording barographs were put under a Bell jar and calibrated. One showed an altitude of 34,983 while the other was slightly lower. Orville Wright boxed three of the instruments for shipment to the Bureau of Standards.

The supercharger was removed the following day when the seat of the trouble was located. Engineering Division officials were elated to find the mishap had not occurred to the high altitude device

Chicago News

An entertainment was given Friday night, Feb 15, by the Illinois Model Aero Club at their club rooms in the Auditorium Hotel, at which several reels of moving pictures from McCook Field, showing scenes from the St. Louis races, were shown Model airplane building has secured a good foothold in Chicago The Lions clubs of Cook County are now backing a movement to instruct boys and girls in miniature airplane building free of charge. The first of these free classes was held Saturday morning, Feb. 16, John Rappold, member of the Illinois Model Aero Club, instructing There were some twenty boys and one colored girl of about ten years, the latter no doubt having been inspired by the aerobatics of Major Fisher, Chicago's colored Ace.

All Lions clubs in Cook county have been requested to assemble their boys into classes so they may take part in the city-wide miniature airplane competition to be held next summer.

The Food Products Club has also become greatly interested in the movement and at a recent meeting decided to present suitable prizes, consisting of food products, to the builders of miniature airplanes best adapted for rapid food transportation.

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Richard Boetcher has again set up his Laird, which received a complete overhaul in the shops of the Chicago Aeronautical Laboratory. It has been painted a bright yellow, easily visible in the sky and a splendid background for wing advertising.

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Airplane service the year round, similar to motor car service at a modern garage, has been in action for three years at the Aero Club of Illinois Flying Field at Ashburn, near Chicago. Several sportsmen have availed themselves of this service, and have been flying quite regularly for the fun of it Gordon Thomas is assistant manager and field radio expert, and John Metzger, hangar manager

Philadelphia News

By C. T. Ludington

As compared with activities at this time last year, it would seem as though little were being accomplished in Philadelphia aviation matters at the present time. Although not as much attention is being drawn to them, nevertheless, real progress is being made

On Dec. 17, a dinner commemorating the 20th anniversary of the first flights of the Wright Brothers was held jointly by the Aero Club of Pennsylvania and the Philadelphia Chapter of the National Aeronautic Association. This was better attended than any previous function of the same kind ever held in the city and those responsible for it felt that their efforts in stimulating useful interest in Philadelphia's aviation needs were meeting with a gratifying response. The aims of the two organizations were outlined by W. Wallace Kellett, president of the Aero Club and Holmshead N. Taylor, the active president of the Chapter. Maj. Gen. William G. Price, Jr., commanding the 28th Division of the Pennsylvania National Guard, spoke regarding the need of a suitable field close to the city so that the members of the Aviation Unit now being formed might have the opportunities and good conditions that are due them. The part that certain operators will take in the activities at the field was not forgotten by the General. Lieut. Alford J. Williams, U.S.N., was met with enthusiasm and made a distinct impression with his talk on the uses of high speed development rather than the spectacular phases of winning the Pulitzer race and breaking the world's speed records.

With the transfer of Comdr. Holden C. Richardson, U.S.N., from the Naval Aircraft Factory to Washington, those interested in plans for the betterment of local conditions lost a splendid backer and efficient adviser.

Herold Pitcairn, who last autumn ordered a 1924 Model

Sport Farman, and who has been flying throughout the winter with G. S. Ireland at Pine Valley, is now flying his new ship and is delighted with it. He has ordered a second and has constructed hangars and a shop on a field near his place in Bryn Athyn.

At an annual meeting of the Aero Club of Pennsylvania W. Wallace Kellett was re-elected president, G. S. Ireland was elected first vice president and C. T. Ludington, second vice president. R. G. Miller was re-elected secretary and Wm. H. Sheahan, treasurer.

The energetic group known as the Episcopal Academy Junior Branch of the Philadelphia Chapter, headed by Alfred J. Ostheimer, III recently made a trip to Lakehurst where they were shown over the Shenandoah.

Winter Photographic Flying Successful

A temperature of 40 deg. below zero does not sound pleasant to most pilots and no doubt many would prefer to remain at home instead of flying in such extreme weather. In Canada, however, it is no unusual thing to see pilots flying in the winter using planes mounted on skis.

The Fairchild Aerial Surveys, Ltd. of Canada have been conducting a series of extremely interesting experiments in winter aerial photographic flying using a Standard, also mounted on skis. The pilot, K. F. Saunders, found that it was not the cold that hampered the work as much as the wind. In order to counteract this, he had the holes in the fuselage carefully plugged, and in the camera compartment where the camera points down through the floor, a cone was built around the camera. This cone had a skirt attachement which prevanted the wind from blowing into the operator's face.

The problem of the water freezing in the radiator was easily solved. For the first time in flights of this kind, kerosene was used in the radiator as a substitute for water and it worked. Getting the motor started was another difficulty to be overcome, and this was done by using a blow torch on the crankcase.

The extraordinary thing about winter flying according to Saunders is that at an altitude of 10,000 ft., the temperature is generally 10 deg. warmer than on the ground.

Peoria News

The winter flying class which the Varney Aircraft Co. is conducting has been growing very rapidly. There are students in attendance from many parts of the country. Roy Cross from the Eastern side of the continent, and A. C. Brown and A. P. Farnsworth from Yakima, Wash., and Shelton, Wash., respectively representing the Western side of the continent.

The company's pilots and mechanics have been busy for some time preparing a home study course which they believe will be practical. This course is for the purpose of broadening the student's knowledge of aviation. While no claim is made that one can become an aviation expert through this course, it should nevertheless be a great help to those having such a desire.

Death of Col. J. L. Travers

Lieut. Col. J. L. Travers was killed at Croydon, England, on Feb. 14 when the small airplane which he was piloting got out of control and took a nose dive from a height of 500 ft. The pilot jumped just before the plane struck, but was fatally crushed.

Lieut. Colonel Travers was one of the famous British pioneer aviators and at the beginning of the war was attached for some time to the air department of the Admiralty. For the past two years, up to recently, he has been in Chile as technical adviser of the Chilean Air Service.

New German Seaplane

The Luftfahrzeug Gesellschaft of Stralsund, Germany, recently produced to the designs of its chief engineer, G. Baatz, an all metal float seaplane equipped with a 185 hp. B.M.W. engine which carries two pilots and four passengers. The plane is a "low-wing" cantilever monoplane of 46 ft. span and 32 ft. overall length, and weighs empty 2800 lb. and loaded 4200 lb. The full speed is 105 mi./hr., the take-off 24 sec. and the climb 3300 ft. in 8 min. The plane is designated as the Arkona-Metal.

France to Dakar Airway Service

The long-discussed scheme for an air mail service to link France and Dakar, the most westerly port of Africa, the organization for which has been proceeding for some time, is shortly to be realized. The new airway will be a very big extension of the existing daily service between Toulouse and Casablanca, Morocco. This is one of the most successful air mail services abroad, which may be seen from the fact that during the past year it carried approximately 3,000,000 letters. This airway is 1150 mi. long, and when it will have been extended to Dakar its length will be 2840 mi.

The ground organization for the Casablanca-Dakar extension was completed last spring, when an experimental flight was successfully accomplished in both directions by three Bréguet planes of the Latécoère Company. The French government has now granted the company 15,000,000 francs by way of subsidy for the operation of the Dakar line. For the first period of its operations the company is preparing for at least three tons of mails per month, and is placing sixty Bréguet machines on the service, with a further sixty in reserve.

The importance of this airway lies in that the South American mails carried by air between France and Dakar will save about nine days over those carried by steamer. As the weight of first class mails directed to South America from the port of Lisbon alone amounts to 166 tons per month, it will be seen that an air mail service could derive large revenues on this route. At present the heavily subsidized Toulouse-Casablanca air mail service carries an average of 5 tons of letters per month, the revenue of which just about pays for the gasoline consumed by the planes. It is estimated that when the Toulouse-Dakar service will carry an average of 100 tons of letters per month—which is not unreasonable to expect once the service is generally known—the revenues will make the service a paying proposition.

New Air Lines in Spain

Concessions have been given by the Spanish government for five new air lines, as follows: San Sebastian-Madrid-Seville-Cadiz-Canary Islands, Bilboa-Barcelona, Seville-Granada, Seville-Zalamea la Real-El Rosal. These lines must be put into operation within six months and all the technical staff and pilots must be of Spanish nationality, foreigners being only admitted if the number of national pilots is insufficient. Mails are to be carried and all aviation material is to be placed at the disposal of the Spanish government in case of emergencies.

Two air lines are now operating in Spain, one from Barcelona to Palma de Mallorca, with Liore-Olivier flying boats, and the other from Seville to Larache, in Spanish Morocco, with DH9e planes. The first named service is owned in part by French capital, while the second air line is part British owned and operated.

New Seaplane Altitude Record

The National Aeronautic Association has been officially notified by the F.A.I. that a new altitude record has been established, as follows:

Class C-2—Seaplanes. (Returning to point of departure.)
Altitude—(France) Maurice Hurel CAMS36 flying boat, 2 Hispano-Suiza 300 hp., at St. Raphael, France, Feb. 2, 1924. 6,368 m. 20,886 ft.

Senate Restores Air Mail Appropriation

An appropriation of $1,500,000 for contioning the transcontinental Air Mail Service was restored to the Treasury-Postoffice bill by the Senate Appropriations Committee in reporting the bill on Feb. 26 to the Senate.

The House had failed to provide the appropriations which would continue the air mail between New York and San Francisco.

Seaplanes for Hydrographic Work

The Italian air department is using a number of seaplanes in connection with its hydrographic survey work in the Red Sea. It appears from preliminary information that excellent results are being obtained from the use of these planes which are equipped with photographic apparatus.

UNITED STATES AIR FORCES

U. S. ARMY AIR SERVICE

Supplies for the Round-the-World Flight

The first shipment of supplies for the World encircling flight to be started next month left the Fairfield Air Intermediate Depot on the evening of Feb. 4. The shipment went by freight to Seattle, where it will be transferred to a ship which will sail on March 1 for Alaskan ports. This shipment consists of three consignments, one of which goes to Sitka, another to Dutch Harbor, Unalaska, and the third to a settlement known as Chicagoff. The last named place is a small fishing settlement on Attu Island and is one of the most remote places in the U. S. territory which is inhabited. Attu is one of the Aleutian Islands. The following day another shipment sent by freight to Seattle left Fairfield. From Seattle the material will be transferred to steamships. This shipment comprises supplies for the following points: Amoy, Yokohama and Nagasak, Japan; Shanghai, China; Saigon, French Indo-China; and Calcutta, India.

There are three Liberty engines in the Alaskan shipment and twelve Liberty engines in the other shipments. These engines are in the best possible condition and are available for instant replacement if they should be needed by the Round-the-World fliers. In addition to these complete engines, the shipments contain everything that might be needed in the way of tools, emergency supplies and replacement parts. All of the boxes are protected by specially prepared covering so that they will not be damaged by the ocean voyage. Each shipment contains one tool box which, when opened, forms a convenient work bench. The location of every item in the tool box is indicated on a diagram on the cover.

In addition to the tools and replacement parts that have been shipped from Fairfield, several boxes of airplane spare parts have been shipped direct from Santa Monica, Calif., to Seattle, and they will be loaded on the same boats with the Fairfield shipments.

The Advance Officer for the Round-the-World Flight who is looking after all the details in Alaskan territory is Lieut. Clayton L. Bissell. When last heard from he was at Prince Rupert, British Columbia.

Reserve Officers Want Planes

Air Service Reserve officers residing in Washington, D. C., and vicinity have determined to use every effort to secure for themselves a number of planes to be stationed at Bolling Field, D. C., in which they can take practice flights and thereby keep themselves in flying condition. At the present time, the Reserve pilots in this section of the country number about 200 officers.

It was brought out at the several meetings at which the matter was discussed, that a number of local municipal governments have provided flying fields at cities throughout the country, and funds were raised through public subscription for hangars and the maintenance of equipment.

Equipment is available in Washington, the Reserve pilots insist, and extensive efforts will be made to secure a number of planes for the Washington Reserve air pilots.

Crissy Field Greatly Enlarged

The landing field at Crissy Field, San Francisco, has been enlarged to almost double its size by the assignment of additional ground in the Presidio for the use of the Air Service. This enlargement will be made possible by the removal of temporary cantonment buildings now occupying the site of the new addition. These are being torn down by troops under direction of Col. William S. Tobin, post quartermaster at the Presidio, in accordance with the approved policy of removing buildings of the temporary cantonment type when their usefulness is ended. The lumber salvaged from these buildings is being used for repair work at the Presidio and at other posts in the vicinity.

Improvements at Kindley Field

A railroad track has been constructed at Kindley Field, Fort Mills, P. I., in order to launch seaplanes. Formerly concrete ramps were used, but rough water destroyed them. Wooden ramps were next used, but due to their weight it was almost impossible to launch seaplanes, and when launched they could seldom be returned to hangars without serious damage. With the installation of a track and car system, launching troubles have ended. Four seaplanes have been launched within thirty minutes. The typhoons do not seem to affect the track at all.

A track has also been constructed on the north side of the island leading to the balloon hangar. This will enable a seaplane to be kept there during the typhoon season when it is usually too rough to launch planes from the south side of the island. Due, however, to the proposed closing of the field within a year, it is doubtful if it will ever be used. It is, nevertheless, a splendid construction job.

During the past six months the police and general condition of Kindley Field has been wonderfully improved. All obsolete property formerly in empty hangars has either been removed or surveyed, and the unsightly shacks around barracks have been torn down.

Radio on the Round-the-World Flight

The radio call letters WYZ have been assigned by the Chief Signal Officer to the Army's Round-the-World Flight for use should the Commanding Officer thereof desire to utilize radio equipment during the flight across the Atlantic. The equipment will, if installed, operate upon the commercial wave length of 600 meters for the purpose of communicating with shipping and commercial shore stations.

Radio will not be used on this flight until the planes reach England, because of the weight of the equipment. For the hop across the northern Atlantic, however, a transmitter will be installed at Hull, England, with a non-synchronous rotary spark of approximately 200 watts range, plane to ground, 100 mi., and a super-heterodyne receiver, both of which will weigh slightly less than 100 lb., including spares and a single weighted trailing wire antenna.

Loening Air Yachts Arrive in Philippines

The long looked for Loening Air Yachts recently arrived at Kindley Field, Fort Mills, P. I. Captain Burge and Lieutenant McKinnon were first to fly one and report it very fast, although rather tricky on control. After flying the slow, loggy and cumbersome HS2L's, the Loenings are indeed a revelation. They have been also flown by Lieutenants Cambin, Gullet and Owens. These Yachts are faster than a DH. Recently Camp Nichols requested an escort for a photographic mission. A Yacht was dispatched and was forced to throttle continuously to remain in the vicinity of the DH.

Meteorological Station at Fort Bliss

Some very interesting data with reference to the winds blowing over the airdrome of the 2nd Division, Air Service, at Fort Bliss, El Paso, Tex., was obtained when the new meteorological station started operations at that post on Jan. 16. It was found that on the ground's surface the wind was blowing at 8 mi./hr. westward, at 2,000 ft. it blew at the rate of 65 mi./hr. westward, while at 7,000 ft. altitude the wind was blowing along at 75 mi./hr. northward.

Statue of Americus A.I.D.

Inasmuch as mail is still being addressed to the Commanding Officer and to the Quartermaster, Americus Air Intermediate Depot, Americus, Ga., the attention of all concerned is called to the fact that this station was closed and placed under a caretaker on May 8, 1923.

Army Orders

Following named officers from stations indicated, effective March 10, to A S, Primary Flying School, Brooks Field, for training: Capts Lawrence F Stone and Lester T Miller, First Lieuts. Philip Schneeberger, Arthur Thomas, William C. Farnum, Robert S Heald, Scott Field; First Lieut Frederick W. Evans and Sec. Lieut. Edward H. Clonser, Langley Field; Sec Lieut. Ernest S. Moss, Phillips Field, Sec. Lieut. Melville I. Murray, Mitchel Field, Sec. Lieut Archibald Y. Smith, Maxwell Field, Sec Lieuts Emory C Cushing, Oscar A Proehl, and Ben E. Cordell, Kelly Field, Sec. Lieut. Leslie F Young, Rockwell Air Intermediate Depot; Sec. Lieut. Lloyd E. Hunting, Marshall Field, and Sec Lieut. Gordon T Waite, Selfridge Field

Maj Walter G Kilner, Office, C.A.S, to Bolling Field, on expiration of leave granted

Sec Lieut Thomas E Meyer, 10th F A, Camp Lewis, to A S, Primary Flying School, Brooks Field, for training

Sec Lieut Cornelius E O'Connor, A S, Kelly Field, after leave granted from June 17, to A S, Philippine department, Manila, by transport leaving San Francisco July 19

One month's leave to First Lieut. George H Burgess, A S., on arrival in New York City.

Sec Lieut John Harding, jr, A S.O R C, Langley Field, to active duty 11th Bombardment Sq, that station, from Feb 15

Three months' leave to First Lieut Charles R Evans, A.S

First Lieut Ulysses G Jones, A S., from treatment Walter Reed General Hospital, to temporary duty Governors Island, on expiration fifteen days' leave, thence to proper station, Panama Canal Department, transport sailing March 20

One month's leave to Lieut Col John H Howard, A S, from Feb 21, with permission to leave continental limits of U S

First Lieut James R Manees, Inf, from assignment with Hqtrs spl troops, Sec Div and further duty, Fort Sam Houston, to A S, Primary Flying School, Brooks Field, for training

Maj Delos C Emmons, A S, McCook Field, to Walter Reed General Hospital for observation and treatment

Three months' leave to Lieut Col Benjamin D Foulois, A S, on arrival in U S

Sec Lieut Townsend Griffiss, A S, Kelly Field, to Brooks Field

Lieut Col Ira F Fravel, A S, Office, C A S, designated for special course training for procurement duties

Orders Nov 16, directing First Lieut Horace N Hessen, A S, Langley Field, proceed to Boston for duty, revoked.

New Parachute Record

Sergt C E Conrad of Kelly Field, broke on Feb 27 the world's record for altitude parachute jump, when he jumped from an altitude of 21,500 ft This is the highest any one has ever jumped from a plane not equipped with a supercharger

U S NAVAL AVIATION

Work on Shenandoah Progressing

It is estimated that the U S S Shenandoah will be ready for flight by May 1 The reconstruction of the tail sections and the bow of the ship is now being carried on. The deflation of the gas cells in the ship is complete, and the outer covering has been largely removed New outer cover panels are being prepared to replace sections of the cover that were damaged in the breakaway of Jan 16

The construction of the new radio outfit for the Shenandoah is well advanced. The work is being carried on at the Naval Research Laboratory at Belleview, D C. It is not expected that the new radio outfit will be in place by the time the ship is ready to take to the air, but will probably be installed on the ship about June 1 This date is dependent upon the date of completion and delivery of the radio generator set that has just recently been contracted for

The after portion of the forward car of the airship (No 6), which was originally fitted out with an engine and propeller, will be reconstructed and turned into a radio room for the new set, after the removal of the engine and gears. A new top will be built of somewhat larger size than the present one. There will be space for a large radio compass and two large transmitters and corresponding receivers. There will also be space for two berths so that the radio watch will sleep alongside the instrument.

A part of the space occupied by the present radio set in the forward part of car No. 6 will be occupied by the new radio generator set. This will be completely enclosed in a sound proof box and mounted on vibration dampening supports so as to reduce the noise and vibrations reaching the operators and instruments.

The tests of the first water-recovery apparatus for the Shenandoah will probably begin at the Naval Aircraft Factory next week. The first set is now complete. If the tests of the different sets of apparatus are successful, installation on the Shenandoah will be made as soon as the changes now being made on the ship are completed.

Future Activities of the Shenandoah

At a conference held Feb 23 in Washington between Rear Admiral Moffett, Chief of Naval Aeronautics, and Lieutenant Commander Lansdowne, commander of the Shenandoah, preliminary steps were taken for the operations of the airship this summer as an auxiliary on duty with the scout fleet in Atlantic waters. The first tests to determine the practicability of using the Shenandoah as an aid to the scout fleet probably will be held somewhere off the New Jersey coast.

Nevertheless, the Navy is still anxious to make the polar flight with the Shenandoah this summer, and in the event permission should finally be given it is prepared to rush to completion plans for the journey

Admiral Moffett reiterated on Feb 24 that, regardless of any plans now being made for the airship so far as the Navy is concerned, there has been no abandonment of the Arctic flight project, and if President Coolidge should give the word, the plans again would be put into speedy operation

Some members of Congress interested in the polar voyage, however, have stated that it would be impossible for that body to give assent in time for the flight which was planned for early in the spring, and no hope is held out by them that the Shenandoah will go northward this year.

In taking command of the Shenandoah, Commander Lansdowne told representatives of the press that the flight to the Pole was "perfectly feasible," but added:

"Action must be taken very promptly if the flight is to be made in June or July, the most favorable time of the year I am ready to take the Shenandoah anywhere. It will be ready in a month, or perhaps a month and a half

"The Shenandoah could fly in the Arctic better, perhaps, than anywhere else. There are certain things about the Arctic region which lead to that conclusion. For one thing, the cold air would mean more lifting power. Then there would not be the difficulty with expansion of gas which is experienced during daylight hours in this zone, and there would not be contraction of the gas at night

"The exploration flight would not last more than three or four days. The ship would make the last leg to the pole from Nome."

Hampton Roads Lighter-than-Air Activities

The lighter-than-air activities at the Naval Air Station at Hampton Roads, Va., are to be transferred to the Naval Air Station at Lakehurst, N J The non-rigid dirigible C7, which has been deflated, will remain at Hampton Roads, and the non-rigid airships J1 will be sent from Hampton Roads to Lakehurst, where it will be inflated with helium and used for training purposes.

Milwaukee and Tennessee Carry Planes

The U S S Tennessee, battleship, left San Pedro, Calif., for Panama on Feb 8 with two UO1 seaplanes on board The U S S Milwaukee, light cruiser, also left for Panama, with one VE7 on board The Milwaukee took another VE7 on board at Panama.

General Mitchell Visits Guam Air Station

Brig Gen William A Mitchell, Assistant Chief of Air Service, paid a short visit to the Marine Flying Field at Guam, M I., in the Pacific, on Dec 27. He was accompanied by Mrs Mitchell

Naval Orders

Comdr Jacob H. Klein, jr., det. U.S.S. Shenandoah, to temp. duty in command Nav. Air Sta. Lakehurst, N. J.

Comdr. Frank R. McCrary, det. command Nav. Air Sta. Lakehust, N.J., and relieved addl duty command U.S.S. Shenandoah, to command U S S. Canopus

Lieut. Comdr. Joseph M. Deem, det Nav Air Sta. Lakehurst, N. J., to Nav. Air Sta. Lakehurst, N. J., for such duty as may be assigned.

Lt Comdr. Zachary Lansdowne, det. Bu. Aero. to command U S S Shenandoah

Lt Comdr. Bruce G Leighton, det. Bu. Aero. to U.S.S. Shenandoah

Comdr Ralph D Weyerbacher (CC) det. Nav Air Sta. Lakehurst, to Nav. Aircraft Factory, Philadelphia.

Lt. Comdr. Edward H Loftin, orders 2-12-24 to Bu. Aero. revoked, to continue duty Office Judge Advocate Gen'l

Lt. Comdr. Robert R. Paunack, det Aircraft Sqdrns. Battle Fleet, to Nav. Aircraft Factory, Philadelphia, orders 11-19-23 modified

Lieut. Richard E Byrd, jr (Ret.) det. all duty, to Bu Aero.

Lieut John J Carroll, (SC) det. Nav Air Sta. Lakehurst to temp duty course instr. Supply Corps School Application.

Lieut Harold A. Clough, det U S S. Patoka, to U S S Sandpiper

Lieut Arthur B. Craig, det Aircraft Sqdrns Battle Fleet to U S S Cincinnati.

Lieut Earl H. Kincaid, det Nav Air Sta Lakehurst, to Rec Ship New York.

Lieut. Lewis S Sutliff, (CC) det Rec Ship New York, to Nav. Air Sta. Lakehurst.

Lieut (jg) John F Crowe, orders 12-6-23 to Nav. Air Sta. Pensacola revoked, to continue duty U.S.S. Florida.

Lieut (jg) Edwin H. Bradley, (SC) det. Rec. Ship, New York, to Nav Air Sta Lakehurst

Gun Matthew Kenney, det U.S.S. Colorado, to Bu Aero

Gun Thomas A. Marshall, det U S S Omaha, to Bu. Aero. addt duty Navy Arctic Expedition, Navy Dept

Pay Clk John G Groebele, det Nav Air Sta. San Diego to U S S Cuyama

Pay Clk Arthur H Patton, det Nav. Hosp Key West, to U S S Aroostook

Municipal landing fields are being established by the Chambers of Commerce of Santa Ana and San Diego, Calif., with the cooperation of the officers of the Aircraft Squadrons Battle Fleet at the Naval Air Station at San Diego. The officers are attached to Fighting Plane Squadron One that remained at San Diego to carry on plane development work while the Aircraft Squadrons were South with the Fleet. This cooperation by the Navy fliers is a big step in the development of public interest in aviation in California and is an example of the work that Naval Aviation is in a position to do for the business interests of the sections in the vicinity of the Air Stations.

Santo Domingo Marine Fliers Active

Seven hundred and ten trips by air is the record of the flights made by Marine Corps Observation Squadron One, stationed at Santo Domingo City, D R, during the year 1923. This record of work done by this organization is excellent proof of its value to the Marine Corps Brigade on duty in Santo Domingo

The activities of the Squadron include scheduled flights each week to a number of towns on the island of Haiti for the purposes of expediting mail movements and for the transportation of officers of the Brigade on official duties

List of MO1 Planes Received

The final shipment of the eighteen MO1, three place spotting planes, was received at the Naval Air Station at San Diego on Feb 14 These planes are being tested and operated by the personnel of Fighting Plane Squadron One, that renamed at the station when the Aircraft Squadrons Battle Fleet went south with the Fleet. The MO1 planes were built by the Glenn L. Martin Co. of Cleveland

Army and Navy Air Services Cooperate

The following letter has been sent to Maj. Gen Mason M. Patrick, Chief of Air Service, by Admiral Moffett.

"My dear General Patrick:

I wish to thank you most sincerely and cordially for your very kind letter, wishing the Navy success in the Arctic Exploration flight.

Your kind offer of assistance is greatly appreciated, not only by myself but by the personnel of the Bureau and the officers who are here making preparations for the trip. I assure you that the Chief of the Bureau of Aeronautics and his entire personnel fully reciprocate your stand, being ready and anxious to assist the Army Air Service in its proposed flight around the world in every possible way. Unofficially we have been doing what we could to meet the wishes of your officers for information and assistance, and will be glad, as I have said, to do everything that possibly can be done.

With kindest regards and best wishes,

Very truly yours,

W. A. MOFFETT."

180 Mile Flight Using Compass Course

A test of flying exclusively on compass course was conducted by two HS2L seaplanes of the Naval Air Station at Pearl Harbor on Feb 2 and 3 The planes made a flight of approximately 180 mi., from Pearl Harbor to Hilo, Hawaii, picking up all points en route by flying compass courses. The flight to Hilo was laid so as to pass the south end of the island of Lanai. On the return trip the planes passed north of all the islands The flight to Hilo was made in 4 hr 10 min. The return trip, aided by trade winds, was made in 3 hr. 5 min.

DT Planes Loaned to the Army

A DT torpedo and bombing plane has been loaned to the Army Air Service for use in conducting parachute tests at McCook Field This plane has been damaged in a forced landing, and another plane to replace the one crashed is to be furnished them, so that the tests may go forward pending the repairs to the first plane

CALENDAR OF AERONAUTICAL EVENTS

March 7-8	Curtiss Marine Flying Trophy Race and Flying Meet, Miami, Fla
March 15.	Start of World Flight of the U. S. Army Air Service, Los Angeles.
March 31	Closing date for papers submitted to Royal Aeronautical Society of Great Britain for the R38 Memorial Prize.
April 23.	National Balloon Race, San Antonio, Tex
June 3-11.	International Aircraft Exposition, Prague, Czechoslovakia
June 15.	Gordon Bennett International Balloon Race, Brussels, Belgium
June 21.	Annual F.A.I. Conference, Paris, France.
June 22.	Commodore Beaumont International Cup Race for high speed airplanes, Istres, France
July 5-6.	Zenith International Airplane Efficiency Race, Paris, France.
August.	"Tour de France des Avionnettes." International Round-France race for light airplanes.
Oct. 2-4.	International Air Races, incl. Pulitzer Trophy Race, Dayton, Ohio
Oct. 24-25	Schneider Cup Race, Baltimore
Dec 17.	Twenty-first anniversary of the first successful airplane flight

Pensacola Class Goes into Advanced Training

Class XIX for Student Naval Aviators at the Naval Air Station at Pensacola, Fla., completed primary landplane training on Feb 15, with the exception of one member. On Feb 18 the class began training in spotting and torpedo planes.

The entire course in primary landplane training for this class was carried out at Corry Field, Pensacola, and consumed approximately 1350 hr., an average of 43½ hr. for each officer. The student officers made 109 cross country flights in JN type landplanes during the course totalling 9,484 mi. Only three of these flights failed of accomplishment through crashes due to the fault of personnel. During the entire course only one student was forced to land because of material failure. In this one case, caused by fuel stoppage due to a clogged line, the fault was twice corrected and the flight successfully completed. The elimination of forced landings bespeaks the progress that has been made in personnel and material during the past few years.

Class XX began ground school work on March 3. Twenty-nine members of this class had reported by Feb. 18, including four Marine Corps officers.

Parachute Flares in Fleet Maneuvers

The Bureau of Aeronautics and the Bureau of Ordnance are very much interested in the great success obtained in the employment of parachute flares by the Aircraft Squadrons Scouting Fleet during the Fleet maneuvers. Apparently they were of the utmost value in illuminating and uncovering night operations. The rather large percentage of failures of the flares to function reported by the Squadrons, is believed to be due to the fact that the flares used were old war time stock. With the use of new flares it is believed that this percentage of failure will be practically eliminated.

Aircraft Squadrons, Battle Fleet

The Aircraft Squadrons, Battle Fleet, consisting of 46 planes in full operating commission, arrived at Culebra, Porto Rico, from Coco Solo, Canal Zone, on Feb. 1. The Squadrons were transported in the aircraft tenders Jason and Aroostook. It is interesting to note that before leaving Coco Solo, on Jan. 25, the entire force of 46 planes were disassembled in one day and loaded on board ship the next. The U.S.S. Jason and Aroostook made the trip to Culebra as a part of the Train, U. S. Fleet.

Publisher's News Letter

There is without the slightest doubt a greater interest in this country with regard to light plane development than in any other phase of aviation. Our mail indicates this. Our interviews confirm it. Questions of all kinds come from all parts of the country as to where information can be had about this or that subject relating to the small plane and its low powered engine. AVIATION has tried to print as much of the news of these light planes as it could find reliable and trustworthy. But evidently it has not been enough. Our readers want more and it is our aim to satisfy this desire. Arrangements to do this are now being made and very shortly our pages will contain a page or two each issue on this timely and hopeful subject.

* * * *

In one of the editorial conferences held with a particularly well informed engineer for the purpose of discussing the light plane the question of single or two seaters came up. Opinion seemed to be decided as to the trend. The single seater appeared to be the favorite for the initial trial period. Particularly for the pilot who wished to "rull his own." These enthusiasts seem to want an air motorcycle in which they can enjoy the sheer pleasure of being in the air with little thought of going any particular place or rushing about at great speed. But the practical engineer has little interest in these home made planes. He already visualizes the production of light engined planes in quantity at a price which will make their popularity great enough to give the manufacturer a market. It is here that the two place idea becomes important. As engineers have a habit of doing, investigations were made in the motorcycle trade and it was found that the side car was forced on the motorcycle people almost against their will for the very simple reason that pleasure of any kind loves company, as does misery. So the engineer's contention, and it appears well founded, was that any production light engined plane to be a commercial success must be a two place job.

* * * *

The Aeromarine Airways is now in its fourth season in Florida. While it has had many obstacles to overcome this year, particularly its delay in arriving in the South, it reports the demand for air travel increasing and if its equipment had been as complete as the requirements called for, the number of passengers carried would have been in excess of previous years. One of the reasons for this is that the public are convinced from the European air routes that air travel is not only safe but a utility that everyone will soon be using without giving it a second thought. Pioneers in transportation always have their obstacles to overcome and the Aeromarine people have not been unlike the early railroad, steamship and automobile promoters. They must be given credit for "holding the bag" for commercial air transport in this country and for this courage they deserve praise and appreciation.

* * * *

Very often we hear the question asked "Where is 'Bill' Mitchel?" We have been told that after visiting the Pacific islands, General Mitchell has reached India and is enjoying the sport of hunting tigers. We hope that the denizens of the jungle will enjoy the encounters as much as the General does. As a hunter of big game he has not confined himself solely to the realm of sport. His temperament is so completely at home when he is engaging in a scrap with someone who differs with him that everybody is awaiting his return with an expectant hope that he will do what is sorely needed—stir up things so that aviation will revive.

* * * *

It will be a blow at American aeronautical progress if Congress does not approve the extension of Air Mail activities by allowing appropriations for night flying. We have within our grasp the greatest boon to air transport that has come since the war. Demonstration has shown it to be practical. Experts in the transportation of mail have hailed it as the next step in advancing the mail. And yet, the Congress may not grant our Air Mail the opportunity of leading the world in this improved mail service. Economy is not to be lightly considered in these days of swollen taxes, but at the same time parsimony to a point where a real service can be rendered is unwise. Congress acts only when it feels that there is a genuine demand for a service. You can do your share in helping if you so desire.

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